

2011 ANNUAL RESEARCH REPORT

FACULTY OF HEALTH,
ENGINEERING AND SCIENCE

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**VICTORIA
UNIVERSITY**

MELBOURNE AUSTRALIA

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WELCOME EXECUTIVE DEAN



Welcome to this annual research report presented by the Faculty of Health, Engineering and Science at Victoria University. It highlights world-class research being conducted in areas of the health, engineering and science disciplines to gain a greater understanding of them. The report signifies another busy year for academics working within Health, Engineering and Science as we approach the huge challenges that lie ahead.

Victoria University is a large multi-sector University located in the west of Melbourne, developing an academic heritage and an international reputation for research excellence. Universities are primarily institutions for the generation and transmission of knowledge. This means that research, or the generation of new knowledge, is fundamental to every aspect of our activities. Victoria University's research is both innovative and relevant. It focuses on future challenges in tomorrow's world. It is creative and links theory to practices, as well as being highly relevant to local and international businesses, government and communities. Whilst our research informs and enriches our teaching, it also makes a large and critically important contribution to the cultural, social, and economic development of Victoria and the world.

The Australian government's 2010 intergenerational report predicts that Australia's population will grow from 22.3 million in 2010 to 35.9 million by 2050. Such a large increase in numbers will have important implications for communities in terms of quality of life (housing, transport, health and education). The next few years will be exciting as we grapple with the problems that confront society at a time of demographic and economic change.

To compete in a global environment, we depend upon technology, vital services and, most importantly, talented people. We have a strategic vision to achieve and sustain national prominence as an academic and research Faculty that is focused on meeting and exceeding researcher needs and expectations. Our staff has the expertise, experience and flexibility to work closely with researchers to best achieve their goals. Our mission is simple: empower researchers to make extraordinary discoveries and innovations; partner with industries; and lead efforts to train the workforce on key skills to help them secure 21st century jobs. Our researchers continue to win major grants in a highly competitive environment and publish in leading international journals and with top academic publishers.

In this report, you will find a sampling of the research successes of the Faculty. We invite you to read, enjoy and be inspired by the work of our researchers who are redefining the realms of their disciplines. We report on new projects, publications, research highlights and other activities. We hope that you enjoy reading about the exciting range and depth of current research and our plans for the future as our organisation steps up our activities.

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FACULTY OF HEALTH, ENGINEERING AND SCIENCE

The Faculty of Health, Engineering and Science aspires for excellence in teaching, learning and research, and is committed to providing students with sound scientific training from leading educators, an innovative learning environment, and customised teaching methodologies. The Faculty takes pride in combining theory and practice with strong links to industry and community experience to ensure our graduates are ready for the real world.

The Faculty is committed to providing quality education with the latest training facilities to prepare students in their chosen career and enhance their learning in the workplace experience.

The Faculty strengths include:

PROBLEM BASED LEARNING (PBL)

- Specialised teaching and learning approach that focuses on using 'real life' problems
- Offers technical knowledge and important skills (problem solving, teamwork, communication)
- Effective tool in developing critical thinking skills to resolve engineering and other problems in the real world.

ENGINEERING INDUSTRIAL EXPERIENCE

- Strong links with Engineers Australia
- Professional practical experience for three months
- Exposure within an engineering environment to observe human and industrial relations, job organisation, maintenance, safety and environmental procedures
- Excellent industry links.

CLINICAL LEARNING EXPERIENCE

- Innovative teaching designed to enhance the student's clinical learning experience
- Opportunities to experience the real nature and challenges of contemporary nursing practice
- Work alongside expert clinicians
- Positive and supportive clinical learning environments across the spectrum of nursing specialties.

NURSING SIMULATION LAB

- State-of-the-art nursing lab in a safe teaching environment
- Emphasis on simulation learning to gain exposure on space and functions of an inpatient setting
- Interactive simulation facilities with live video streaming capabilities for enhanced student participation.

HEALTH SERVICE CLINICS

- Emphasis on providing learning, teaching, research and practice facilities for the next generation of health professionals
- Focuses on industry based projects and simulation laboratories.

PARAMEDIC CLINICAL PLACEMENT

- Exposure to the responsibilities and experiences of the ambulance paramedic
- Professional development for students to learn to observe, consolidate and extend their knowledge and skills in the clinical care of patients in a pre-hospital environment.



RESEARCH

The Faculty has a strong reputation in undertaking fundamental and applied research, focussed on developing technologies. The Faculty operates world-class research and development in our three specialised research centres:

Centre for Applied Informatics (CAI)

The Centre focuses on e-research, data mining, data management, internet and web services-based technologies that can be applied to almost every industry and sector. Our key research and applied areas are: community, business, education, environment, health, and security, in projects as diverse as e-health, water resource management, social computing, etc.

Centre for Environmental Safety and Risk Engineering (CESARE)

A leading research centre and course provider in the area of fire safety and risk engineering. Research and consultancy work are undertaken for a variety of industrial and government organisations such as: OneSteel, BlueScope Steel and Fire Code Reform Centre.

Centre for Telecommunications and Micro-Electronics (CTME)

This Centre is focused in telecommunications, microelectronics, optics and photonics. The Centre has strong affiliations with the Australian Communications Research Network (ACoRN) and the National Networked Teletest Facility for Integrated Systems.

The Faculty has three Schools with courses in the following disciplines:

COURSES

School of Nursing and Midwifery

- Undergraduate
 - Midwifery
 - Nursing

School of Engineering and Science

- Undergraduate
 - Architectural Engineering
 - Building Engineering
 - Building Surveying
 - Civil Engineering
 - Electrical and Electronic Engineering
 - Information Technology
 - Mechanical Engineering
 - Science Specialisation (Biotechnology, Chemistry or Ecology and Environmental Management)
- Postgraduate
 - Computer Science
 - Electrical and Electronic Engineering
 - Project Management
 - Wireless and Network Engineering
 - Sports Engineering

School of Biomedical and Health Sciences

- Undergraduate
 - Biomedical Sciences
 - Clinical Science – Osteopathy
 - Dermal Therapies
 - Nutritional Therapy
 - Nutrition, Food and Health Science
 - Paramedic Studies
 - Science/Psychology
- Postgraduate
 - Osteopathy
 - Dietetics



THE FACULTY OF HEALTH, ENGINEERING AND SCIENCE IS MANAGED BY



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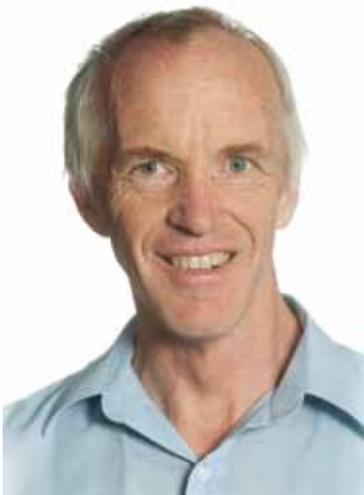
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Professor Graham Thorpe
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Dr Daryl A. Cornish
Faculty General Manager

FACULTY RESEARCH

The Faculty of Health, Engineering and Science undertakes fundamental and applied research focused on developing innovative technologies with direct application to industry and the community. Research is concentrated in the applied areas of health, engineering and science. Research activities support the academic courses offered by the Faculty and vice versa.

RESEARCH STRENGTHS

Health

- Biomedical science
- Human nutrition and dietetics
- Muscle and exercise physiology
- Acute and chronic illness in clinical and community health, and clinical and biomedical science
- Mental health
- Pregnancy

Engineering

- Fire safety and risk engineering
- Sustainable buildings
- Structural mechanics and materials
- Water resources
- Thermodynamics and fluid mechanics
- Vibrations and dynamics
- Packaging and distribution
- Smart energy
- Alternative energy
- Telecommunications and microelectronics
- Optics and photonics
- Food science and technology

Science

- Applied ecology
- Applied mathematics
- Internet technologies and applied informatics
- Biotechnology
- Chemical and analytical science
- Polymer science

Most of the research is conducted through the University Research Centres, and research groups hosted by the faculty:

- Centre for Applied Informatics (CAI)
- Centre for Environmental Safety and Risk Engineering (CESARE)
- Centre for Telecommunications and Microelectronics (CTME)
- Advanced Food Systems
- Alternative Energy
- Applied Ecology
- Applied Mathematics
- Biomedical and Lifestyle Diseases
- Clinical and Community Health
- Engineered Packaging and Distribution
- Smart Energy
- Structural Mechanics and Materials
- Telecommunications, Electronics, Photonics and Sensors
- Water Resources

Our research is also aligned with university research strengths and our researchers have direct links with the University's institutes, including:

- Institute for Supply Chain and Logistics (ISCL)
- Institute for Sustainability and Innovation (ISI)
- Institute of Sports, Exercise and Active Living (ISEAL)
- Australian Community Centre for Diabetes (ACCD)

PROBLEM BASED LEARNING

Problem-based learning (PBL) is a team-based teaching and learning approach that uses 'real life' problems to help you gain technical knowledge and develop important skills like problem-solving, teamwork, communication and locating information. What makes PBL different from conventional teaching is that it starts with problems related to real world practice. This makes it different from conventional teaching where content is first taught in lectures and then applied by solving problems in tutorials and assignments. PBL is designed to help you become an independent learner but it does not do this by using a sink-or-swim approach. Instead, it provides you with plenty of support as you develop the skills you need for learning in a PBL team.



Skills taught include:

- Communication in all forms
- Mathematical and numerical ability
- Use of information communication technology
- Creativity
- Interpersonal and team working skills
- Improving own performance and self learning skills
- Problem solving
- Business skills
- Project management skills
- Information literacy skills.

THE VU ENGINEERING PBL MODEL

The PBL model is being used for all BEng courses at VU. This model is built on the principles of active learning (problem-based and project-based learning), collaborative learning (learning in PBL teams) and integrative learning (applying knowledge from several units of study). It includes a staged introduction to PBL that commences with short problems in first year and progresses through community-based projects and then to industry-based projects in later years. The first year of the course is common to all Bachelor of Engineering courses and has a strong emphasis on helping you to make the most of learning in a PBL environment. It also includes built-in student support in learning, language, mathematics and technical skills.

Key features of the VU PBL in Engineering model are:

- Active learning, collaborative learning and integrative learning
- Common first year
- Staged introduction to PBL
- Community-based and industry-based projects.

SPECIAL FEATURES OF PBL ENGINEERING MODEL

One of the most important features of our model is that the problem/project is in the centre of the curriculum. The model allows students to work on small problems in year 1, community and/or industry projects in years 2 and 3, and Engineering practice on industry projects in year 4. Our engineering students think and practice beyond engineering in an interdisciplinary approach.

CENTRE FOR APPLIED INFORMATICS

The Centre for Applied Informatics (CAI) focuses on e-research, data mining, data management, internet and web services-based technologies that can be applied to almost every industry and sector, and given the widespread use of the internet, now applies to every modern community.

The success of the research undertaken by the Centre has already demonstrated the diversity of the application areas, such as:

- Community – research that applies within a social population community content;
- Business – research that applies to general business performance initiatives, such as web services-based projects;
- Education – research that applies to e-learning initiatives;
- Environment – research that applies to environmental science based initiatives, including the conservation, sustainability and resource usage (e.g., water resource management);
- Health – research that applies to health and medical initiatives, that includes medical practitioners, administrators and support staff informatics requirements, and extends to the general public information requirements as users of medical facilities; and
- Security – research that applies to information security, law enforcement and defence initiatives.

Whilst the Centre is multidisciplinary in the application areas, it is positioned to generate sustained research output specifically in the e-technology arena with a high commercialisation potential.

RESEARCH ON E-HEALTH

e-Health is playing an increasingly important role in healthcare. Technically, e-Health refers to the use of information and communication technologies (ICTs) in health domain. e-Health has diverse applications, such as health information networks, telemedicine, electronic medical records, health knowledge management, personal wearable and portable communicable systems, health portals, and health research data. ICT-supported interdisciplinary information utilisation will provide a better platform for successful decision-making and quality management in healthcare. The research of e-Health will explore a range of practical strategies to enable ICTs to be integrated within health and wellbeing promoting projects, with particular application to the fall risk detection and prevention, and health data management.

Our current e-Health projects include:

- WHO eSTEPS 2.0
- Tasmanian Web-Based Epidemiology System
- GPEConnect
- PhysAnalyser

RESEARCH ON E-WATER

Water resource management requires access to meteorological data, and spatial data such as digital elevation, land use and remote sensing data. Current approaches to water resource management, for the most part, are operating independently whilst generally working towards the same objective. While each of these activities has been effective in their own right, there are major benefits and synergies to be gained through a coordinated integration of these tasks. Therefore, it is crucial and promising to deliver research on water resource management and ICT related issues, including the framework for the integration of all data and modelling services related to water resource management for a region, field monitoring with its associated spatial, temporal trend analysis, remote sensing, and predictive modelling which facilitates and supports management decisions.

Our current e-Water projects include:

- Water Web @VU
- Water Resource Decision Support
- Water Cycle Management

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CENTRE FOR ENVIRONMENTAL SAFETY AND RISK ENGINEERING

The Centre for Environmental Safety and Risk Engineering (CESARE) undertakes research in the areas of fire safety and risk engineering and sustainable architecture. The Centre has world-class facilities for testing the response of materials and structures to fire. CESARE has a burn hall that has a width and length of 40m and 70m respectively and it can be used to carry out very large scale fire tests. Our academic and research staff have research and practical experience in areas of structural behaviour in fire, heat transfer, mechanical systems, human behaviour in fire, risk assessment and management, fire detection systems, and sustainable architectural design.



Our research covers sustainable architecture and almost all areas of fire safety engineering which includes:

- Sustainable architecture
 - The integration of architecture and engineering
 - Building form and environmental sustainability
- Fire dynamics in enclosures
 - Bench-scale experimentation
 - Full-scale fire tests
 - Computational fluid dynamics
- Fire risk analysis
 - Analysis of fire statistics
 - Effectiveness of fire safety systems and components
 - Protection of transport systems such as trains, bridges, etc.
- Structures in fire
 - Large displacement behaviour of structural steel buildings in fire
 - Design of steel and composite floors for fire resistance
- Human behaviour leading to and during fire.

FIRE TEST FACILITIES

CESARE offers research and testing opportunities for applications in fire safety engineering including:

FIRE TEST FURNACES

The fire test furnaces are used to study the thermal and structural behaviour of elements of construction. These experimental findings are useful for product improvement or to provide thermal data to allow the calculation of performance. These facilities allow testing of loaded floors, loaded walls and other such setups under either hydrocarbon or standard fire test heating regimes.

A CONE CALORIMETER

The cone calorimeter provides a method of testing the reaction of materials to heat exposure.

In this test, small samples of materials (100 mm x 100 mm) are exposed to various levels of radiation and the resulting products of combustion are drawn into a hood and analysed allowing various calculations, such as the mass loss and heat release rates, to be determined.

3MW CALORIMETER AND INTERNATIONAL STANDARD ORGANISATION (ISO) ROOM

The 3MW calorimeter is similar to the cone calorimeter but at a much larger scale. It allows the burning characteristics to be established for a variety of items, such as furniture, by burning them directly under the hood or within an ISO room. Measuring 3.6 m x 2.4 m x 2.4 m high, an ISO room is a standard for tests that allow the evaluation of lining materials giving a good indication of how they might behave in buildings.

LARGE FIRE TEST FACILITIES

The CESARE Large Scale Experimental Building-Fire Facility is located in Fiskville at the CFA training facility, 10kms south of Ballan. In its earliest form it consisted of a multi-level building, incorporating a stair shaft which can be pressurised, in which experimental research on fires in bedrooms and other investigations was undertaken.

FOUR STOREY BUILDING SCALE MODEL

Various scenarios can be simulated utilising the detailed four storey building model allowing researchers to study fire and smoke movement that might occur in one or over several levels, including lift and stairwell involvement. By varying the location of fuel and ventilation, the effects of different ventilation arrangements can be measured using more than 160 thermocouples and other instruments.

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CENTRE FOR TELECOMMUNICATIONS AND MICROELECTRONICS

The research within the Centre for Telecommunications and Microelectronics (CTME) is associated with the discipline of electrical engineering and related areas of science and has close links with academic staff from the School of Engineering and Science.

The laboratories and facilities have been built-up over a considerable period of time, and significant internal funding in recent years has enabled the upgrading of vital equipment. Key equipment includes the wireless laboratory (up to 40 GHz) with network analysers, signal analysers, spectrum analysers, complemented by the microelectronics laboratory offering EDA tools (Cadence, ADS, etc.), access to HP93000 based System on a Chip (SoC) ASIC test equipment and Opnet for mobile networks.

Well-equipped optics facilities includes high power lasers, supercontinuum source, optical fibre Bragg grating fabrication facility (based on a frequency-doubled argon ion laser), confocal scanning microscope, spectrum analysers and monochromators, wavemeter, plus vibration-isolation optical tables.

The Centre is focused on the research strength of VU in communication and sensor technologies, and includes the fields of:

TELECOMMUNICATIONS

Future wireless telecommunication services.

Group Leader: Professor Mike Faulkner

MICROELECTRONICS

Design of new microelectronic systems for solving instrumentation problems.

Group Leader:

Associate Professor Aladin Zayegh

OPTICS & PHOTONICS

Optical fibre technology and optoelectronic imaging

Group Leader: Professor Stephen Collins

The research of CTME includes:

- Multiple input multiple output wireless systems
- Cognitive radio
- Microelectronic systems for instrumentation
- Microelectronic systems for healthcare
- Optical fibre Bragg grating sensors, including civil and biomedical applications.
- Rare-earth-doped optical fibres and their use for sensors and amplifiers
- Optoelectronic imaging of optical devices

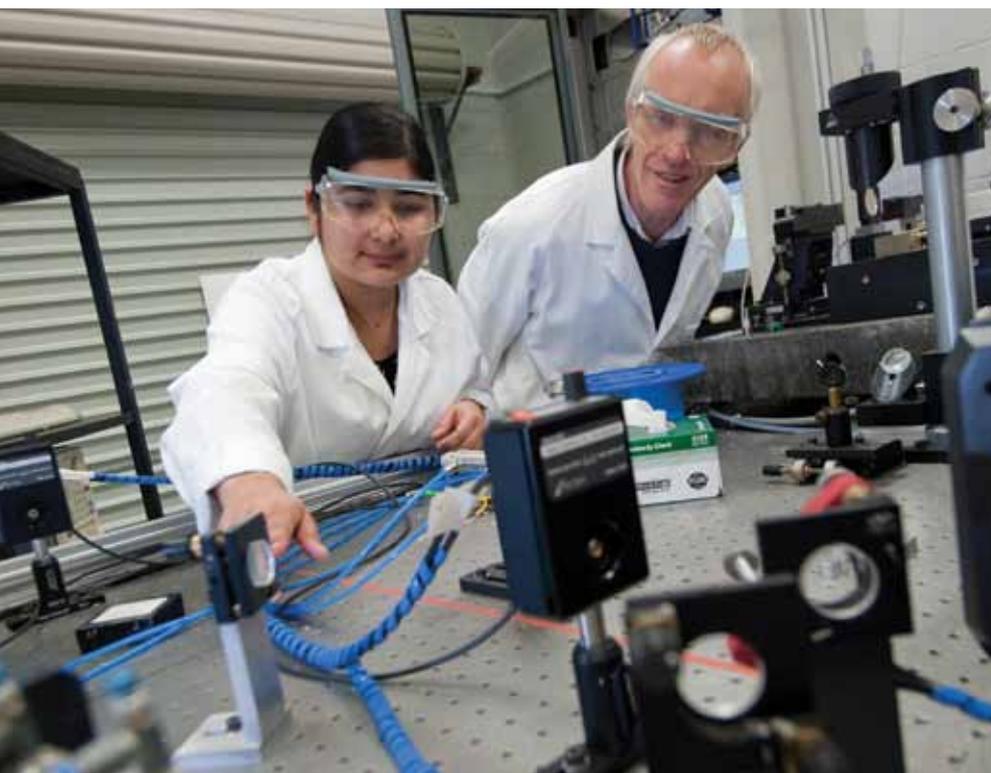
Telecommunications, Electronics, Photonics and Sensors Faculty Research Unit (TEPS) will replace the Centre for Telecommunications and Microelectronics in 2012.

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FACULTY RESEARCH GROUPS

ADVANCED FOOD SYSTEMS

Our research aims to resolve the challenges of sustainability, and healthy feeding practice of the growing future population in industrialized and developing nations through scientific and technological advancements.



AREAS OF RESEARCH

Our research is aligned with 3 Australian national priorities:

- Environmentally sustainable Australia
- Promoting and maintaining good health
- Frontier technologies for building and transforming Australia

Our researchers are involved in a number of themed projects.

- Analytical systems

Methods development and analysis of food components

- Macromolecular systems

Fundamental research on understanding physical and chemical interactions governing the properties of complex food macromolecules during various units of operation

- Bioprocessing systems

Fundamental and applied food biotechnology

- Sustainable food systems

Advanced approaches in the food industry to ensure innovative and sustainable utilization of our natural resources.

RESEARCH EXPERTISE

Food Processing

- Dairy processing technologies and techniques
- Grains, fruits and vegetable processing
- Separation and extraction processes
- Advanced membrane technologies→ Functional Foods and Nutraceuticals
- Physiological properties of dietary proteins
- Improvement of functional properties of whey proteins
- Improvement of physiological functionality of whole grains
- Specialised processing to preserve functional qualities of foods

Enhancement of Shelf Life

- Technologies and techniques for increasing shelf life
- Novel methods for preservation of bioactive materials
- Impact of food preservation technologies on functional properties
- Food safety and security
- Risk assessment of the supply chain

Physical Chemistry of Foods

- Food rheology
- Food property characterisation and modelling
- Impact of hydrostatic and hydrodynamic pressure on proteins
- Protein-protein and protein-polysaccharide interactions
- Functional properties of dairy products

Dairy Science and Technology

- Value-added dairy products
- Advanced processing technologies and techniques
- Fermented dairy products (i.e. cheese and yoghurt)
- Functional properties of milk
- Advanced membrane technologies in dairy processing (novel ingredients, energy and water recovery)

Microbial and Enzyme Technology and Engineering

- Indigenous animal and microbial enzymes and their application
- Novel microbial applications in waste water treatment

Analytical systems

- Development and application of novel methods for analysis of allergic proteins
- Novel bioassays for in vitro assessment of physiological bioactivity
- Method development for identification of immunomodulatory compounds

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APPLIED ECOLOGY

The Applied Ecology Research Group at Victoria University conducts extensive research in the field of ecology, including the management and conservation of plants and animals, ecosystem management/rehabilitation and plant and animal responses to a range of human and introduced species interactions.

Many species and ecosystems worldwide are threatened by various processes including habitat loss, overexploitation, pest species invasions and pollution. In Australia, protection of endangered species and ecosystems is a priority that has been enshrined in legislative acts.

Our research has a practical focus, resulting in quantitative information provided to state, federal and international environmental agencies and is used to positively influence the protection and rehabilitation of endangered species and ecosystems.

AREAS OF RESEARCH

Ecosystem management

We conduct critical research into the management of several key ecosystems, with primary focus on innovative methods for restoration and rehabilitation of damaged ecosystems. Part of our studies involves investigating ways of managing existing threats. Some of the main areas we work on are:

- Grassland and Grassy Ecosystem
- Inland and coastal wetland systems
- Pest plant and animals
- The use of fire as a management tool
- Interactions between management and plant/animal populations

Flora research

Our plant research involves the aspects of plant physiology and their life cycles. The study is critical to the management of the plant species in the wild, understanding their limits, and population demographics. Additionally, we carry out work on horticulturally and agronomically important plant species that contribute directly to human wellbeing. Some specific studies involve:

- Orchid population ecology
- Plant genetics
- Weed Ecology
- Plant recruitment
- Clonality in plants
- Morphological responses of plants to climate change.

- Identifying molecular markers to assist accelerated crop breeding
- Determining candidate genes involved in quality traits in agronomically important plant species.

Fauna research

To achieve effective and sustainable management of wildlife populations it is of upmost importance to understand the population dynamics of the individual species, the ecosystems they occupy and their interactions with humans. Our studies focus directly on research that has a direct management outcome, including:

- Marine cetacean, Megafauna, pinniped and penguin tourism impacts and management
- Shellfish fishery management
- Striped Legless Lizard Ecology and Management
- Waterfowl population genetics
- Impacts of human disturbance on waterbirds
- Management, hybridisation and conservation of waterbirds.
- Morphological impacts of captive breeding

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APPLIED MATHEMATICS

The Applied Mathematics research group specialises in applied mathematics, mathematical inequalities, networked control systems and approximation and bounds in economics, and general applications across the engineering and science disciplines.

AREAS OF RESEARCH

Our main focus is on interdisciplinary research and application of mathematics, statistics and operational research for solving problems. Including:

- Complex dynamical systems modelling
- Analysis and design of control and filtering
- Mathematical inequalities and their applications in numerical analysis
- Information theory & coding
- Population dynamics
- Special functions theory and probability and statistics

RESEARCH EXPERTISE

- Reliable control theory and applications
- Novel optimization techniques
- Fault detection and isolation, fault tolerant control
- Cost benefit analysis and control
- Risk analysis and management
- Intelligent systems and information processing
- Complex dynamical system performance analysis and design with partially known information
- Hybrid systems modelling, analysis and design

RESEARCH PROJECTS

- Networked control systems with large time-delay interval.
- Accurate numerical approximations and bounds in economics, statistics and general applications across the Engineering and Science disciplines.
- State filtering and parameter identification for nonlinear polynomial systems.
- Approximation and bounds in a variety of areas including risk/ruin problems, actuarial science and populations.

- Robust control and filtering on stochastic jump systems with partially known transition probability
- Design of control and filtering on switched systems with parametric uncertainties
- Stability and stabilization on dynamical systems with time-delays
- Design on nonlinear systems by fuzzy modelling techniques
- Networked control techniques with packeted data dropout and random delays

COLLABORATION

The group has established a very fruitful collaboration with members of the School of Computational and Applied Mathematics from the University of the Witwatersrand, South Africa.

VU has also identified the Applied Mathematics Group as one of its underpinning research strengths, further demonstrating the directional shift to applied mathematics. Members of the group collaborate extensively with institutions such as the Institute of Sustainability and Innovation and the Institute for Logistics and Supply Chain Management.

The members teach within the School of Engineering and Science to train Engineers, Scientists and future Mathematics teachers.

The main aim of the group is to focus on interdisciplinary research where Mathematics, Statistics and Operational Research can provide powerful tools in solving problems. The unit is open to any academic whose research interests include but are not limited to the use of Mathematics in any of its possible manifestations or forms.

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ALTERNATIVE ENERGY

The Alternative Energy Group carries out research on biofuels, wind and solar energy, desalination techniques, and on environment protection and wastewater treatment.

Our academic and research staff have experience in areas of Fluid Dynamics, Heat and Mass Transfer, Analytical Chemistry, Power System Communications, and Environmental and Water Engineering.



The climate changes have raised many serious challenges to our societies globally and Australia in particular in terms of reducing our reliance on fossil fuels, providing enough potable water and living in a safe environment.

It is believed that, in order to meet these challenges, we need to replace our consumption of fossil fuels with alternative energies such as wind, solar and biofuels, to provide enough drinking water to an increasing population from water conservation and desalination of sea water and/or brackish water, and to treat our wastewater to high quality to maintain a safe environment

AREAS OF RESEARCH

The Alternative Energy Group focuses research on developing techniques in Solar and Wind Energy, Biofuels from Algae, Energy Storage, Renewable Energy Systems, Sustainable Buildings, Distributed Generation, Energy Efficiency, Microgrids, Membrane Distillation, Thermal Desalination, Wastewater Treatment, Industry Wastewater Processing and Recovery, and Environmental Protection.

RESEARCH PROJECTS

Currently, our Group is involved in many projects related to alternative energy, desalination, wastewater treatment and environment protection. These include:

- Water Conservation by Replacing Cooling Towers
- Algae for Biofuels and Wastewater Treatment
- Membrane Distillation
- Humidification and dehumidification desalination
- Heat and mass transfer in compact heat exchangers
- Small Wind Turbines for Residents and Schools
- Detection of Blue-Green Algae
- Modelling and Development of Microbial Electrolysis and Fuels Cells
- Hardware Analysis of Fuel Cell/ Photovoltaic Systems
- Analysis of Wind Power Potential in Melbourne's West
- Photovoltaic Power Analysis for Brimbank Victoria, Australia
- Development of a Microgrid Energy Management System with Distributed Generation

- Digital Habitat Ecosystem Architecture (DHEA) for the Optimised Utilization of Resources in Built Environments
- The Modelling of Energy Efficient Virtual Power Station

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BIOMEDICAL AND LIFESTYLE DISEASES

Our research is focused on expanding our knowledge on the role that lifestyle associated diseases play in limiting not only our lifespan but also our quality of life.

Our ability to age well and age productively is affected by a number of health issues, including:

- obesity
- diabetes
- cardiovascular disease
- cancer
- inflammation
- gastrointestinal issues (including Irritable bowel, GIT diseases, and appetite regulation)
- musculoskeletal health (including physical functioning and sarcopenia)

To expand our knowledge, the Biomedical and Lifestyle Diseases Unit utilise laboratory based scientific inquiry as well as applied clinical and therapeutic interventions to promote health and prevent illness, restore health, and promote the wellbeing of individuals.

RESEARCH FOCUS

Lifestyle associated diseases

Poor lifestyle is the overriding health problem, that is linked to elevated risk of many chronic diseases (including, but not limited to, Obesity, Type II Diabetes Mellitus (T2DM), cardiovascular disease and cancer), with an array of health consequences. This imposes a tremendous financial and social toll on the overall health of the Australian population.

RESEARCH APPROACH

The laboratory based investigative approach uses intensive laboratory analysis of health related phenomena with the intent of future clinical application. This approach provides greater understanding of the underlying mechanisms of medical conditions, such as the development of obesity related illnesses.

This unit aims to integrate the disciplines of nutrition, biomedical and physiological sciences and osteopathy, to provide a multifaceted approach to public health needs. The capacity of this research



team can progress research at any point from pure scientific inquiry to applied physiological and experimental medicine and further translating this into promotion of positive health outcomes in a society being crippled by our current lifestyle promoted preventable diseases. Basic biomedical research is applied to problems of modern diseases of abnormal adaptations, converting it into practical therapeutic and public health applications. Discipline areas include:

- Molecular and nutritional physiology and pharmacology
- Biophotonics and bioimaging
- Immunology and food science
- Nutrition and dietetics
- Osteopathy
- Women's health
- Complementary medicine and musculoskeletal health

One of the key strengths of this research unit is the ability of its researchers to translate these laboratory based findings, which may involve in vitro or animal models, into human models of these disease states. Ultimately leading to enhancement of clinical management and prevention, and as a consequence, improve the lifestyle and wellbeing of individuals.

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CLINICAL AND COMMUNITY HEALTH

The Clinical and Community Health Faculty Research Unit addresses important healthcare challenges and conducts leading edge, collaborative research to improve health and well-being, enhance clinical and community care, and enrich quality of life.

The works of our qualified academic researchers are focused on three key research programs.

- Mental health
- Pregnancy
- Acute and chronic illness

MENTAL HEALTH RESEARCH

Mental health research focuses on three main areas: prevention and early intervention in people with mental health problems, including alcohol and drug misuse issues; promotion of recovery in people with severe and enduring mental illness; and promotion of primary caregiver/family coping and wellbeing.

RESEARCH PROJECTS

- The experience and needs of primary caregivers of elderly family members/friends with mental illness.
- Evaluating the use of restraint and seclusion in inpatient aged psychiatry units.
- Mindwise: Preventing mental health problems in young people through better mental health literacy
- Exploring needs – examining barriers to service access: Youth with depression, anxiety and substance use issues.
- A peer support program for enhancing medication adherence in mental health consumers with schizophrenia.
- Problem-solving based self-help manual for primary caregivers of family members with first-episode psychosis.
- Evaluation of a cognitive behavioural bibliotherapy self-help intervention program on the promotion of resilience in individuals with depression

PREGNANCY RESEARCH

Pregnancy research focuses on women's pregnancy experiences, adverse outcomes and risk in pregnancy, perinatal health and morbidity, gestational diabetes, older maternal age, and sexual health.

RESEARCH PROJECTS

- Gestational diabetes among multiethnic groups in the Western Region of Melbourne.
- Having a baby in Australia: African women's experience.
- Anxious waiting: soft markers and high risk pregnancy.
- Perinatal morbidity among Australian women aged 35 years and older.
- Limerick Lullaby project: An intervention to relieve stress in pregnancy.
- Promoting normal birthing: Endeavouring to develop midwifery focused scope of practice.

ACUTE AND CHRONIC ILLNESS RESEARCH

Acute and chronic illness research concentrates on investigating interventions which will enhance standards of community and hospital care in collaboration with health service providers, in particular, evaluation of current practice and the generation and use of evidence to improve patient outcomes.

RESEARCH PROJECTS

- Intranasal fentanyl for women in childbirth.
- Intranasal naloxone for heroin overdose.
- Effectiveness of bedside handover.
- Evaluation of medication endorsement for Enrolled Nurses
- The use of health data to improve nursing services and the quality of nursing practice.

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ENGINEERED PACKAGING AND DISTRIBUTION

Our mission is to provide a local, national and international focus for scientific research aimed at developing environmentally sound and optimized solutions to support the distribution of products and produce. In particular:

- Food security
- Food packaging
- Sustainable packaging
- Optimised and engineered protective packaging
- Packaging waste reduction
- Post-harvest technologies
- Biodegradable and antimicrobial packaging
- Environmental and distribution hazards



The Engineered Packaging and Distribution Research Group have strong links with the Institute for Sustainability and Innovation, and the Advanced Food Systems Research Unit, with expertise in areas that relate to:

- Environmental shock and vibration
- Distribution dynamics
- Material characterisation
- Protective packaging
- Polymer chemistry
- Analytical chemistry
- Active food packaging (modified atmosphere, antimicrobials, biocomposites)
- Biodegradable polymers
- Post-harvest technologies

CURRENT RESEARCH PROJECTS

- Development of statistical models for the characterisation of distribution vibrations.
- Development of sophisticated techniques for the analysis and simulation of transport vibrations.
- Development of inexpensive and effective packaging materials.
- Development of techniques for the performance characterisation of environmentally friendly materials.
- Development of novel methods for determining the progression of damage in packaging elements during distribution.

- Use of strain mapping (using High-speed Digital Image Correlation) to optimise cushioning systems for impact absorption.
- Development of sophisticated postharvest technologies such as new engineering procedures to design hydrocoolers.
- Design and implementation of a novel solar powered grain cooling system.
- Exploiting the principles of multiphysics and omniscience to improve the storage, packaging and transportation of foodstuffs.
- Developing information technology systems to enable groups of people to contribute to joint decision making in the distribution and handling industries.
- Development of testing facilities to measure biodegradability of packaging materials.
- Development of biocomposites with natural fiber fillers for antimicrobial packaging.
- Development of methods of quality assessment of fresh and processed produce.

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SMART ENERGY



Our research help modern power engineers work with end-user applications and devices such as smart metres, and develop strategies for grid design and operation, and address interconnection and intra-facing frameworks within each individual substation of the grid such as generation, transmission and distribution.

Making the electricity grid smart has become a worldwide priority. To bring aging electric grids into the 21st century requires incorporating power engineering with the latest digital communications system and information technology areas including sensors, electronics, controls and wireless devices. There are many benefits to a smart electricity grid.

- Electric utilities could turn off loads remotely at times of peak demand.
- Utilities could also better manage integration into their distribution systems of new modes of power generation such as solar and wind.
- Consumers are informed and in control of their power consumption.

Areas of research

- Automation and Control Systems
- Intelligent Systems and Information Processing
- Fault Detection techniques
- Operational Research
- Signal and Image Processing

RESEARCH THEMES

Smart Energy Systems

- Power System - Analysis, Control, Communication, Quality, Stabilization, Protection, Renewable Energy, Cogeneration, Intelligent System, Energy Storage, Fuel Cells, Distributed Generation and Energy Market.
- Control Theory - System Design, Fault Detection Techniques, Markov Decision Processes, Operational Research; Intelligent Control; Control Applications and System Identification.
- Engineering Education - vocational, work-based, PBL and transition from secondary school.

RESEARCH PROJECTS

Implementation of the IEC61850 International Protocol for Accurate Fault Location and Arc Voltage estimation in Overhead Power Lines.

- Investigation into the viability of an off grid highly reliable solar/hydrogen power solution
- High performance electric vehicles
- Experimental Analysis and Development of a Modern Secure Power System
- Impact of Distributed Generation (DG) on Smart Grid (SG)
- Advanced Transient Control of a Hybrid Solar/Diesel Electric Power System

- Medium High Voltage Power Cables Testing and Diagnostics
- Direct Current based microgrid/distribution/power system/grid Integration of DG
- Power Quality Issues in Electric Power Distribution System
- Experimental Analysis and Development of a Secure Power System
- Investigation of distribution networks with non-conventional energy sources
- Direct Duty Ratio Based PWM Technique for a Three-to-Five Phase Matrix Converter for Supplying Five-phase Two-motor Drives

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STRUCTURAL MECHANICS AND MATERIALS



Our research focus relates to the all-encompassing design, environmental impact and cost consideration associated with producing 'sustainable structures and materials'.

Australia has a continually evolving infrastructure. The country also has a number of aging structures susceptible to dynamic effects that needs to be monitored, especially if they have suffered some loss in structural integrity over time. Considering the events of the last decade and the effect on structures under blast loading and fire, it is now paramount to assess the traditional design and construction methods, and incorporate other considerations in order to ensure a sustainable and durable structure.

Research is conducted into the design and analysis of structures that includes consideration of the effects of dynamic loading, blasting and fire in addition to the typical dead and live loading anticipated.

Our Group continues to investigate alternative aspects of designing and assessing structures using up-to-date research including dynamic analysis techniques, simulated blasting techniques and fire modelling.

We also undertake structural health monitoring to assess structures that are already in-service. Structural Mechanics is a strong stream in the Civil, Architectural and Mechanical Engineering programs taught by our research members. Related units include solid mechanics, structural design, stress analysis and structural dynamics.

RESEARCH THEMES

Structural health monitoring

- Dynamic behaviour of concrete structural elements
- Measuring dynamic behaviour of structures that have been affected in some way by sustained use
- Structural damage detection in timber bridges using response signals
- Non-Destructive assessment of timber bridge characteristics.

Fire performance of structures and members

- Using alternative materials such as polymer fibres or geo-polymer concrete to resist fires within concrete elements
- Hybrid Testing Facility for Structures under Extreme Loads
- Improvement of spalling resistance and performance of slender reinforced concrete walls subjected to fire.

Behaviour of high performance materials

- Structural behaviour of polymer fibre reinforced concrete
- Design implications on structures when utilising high strength concrete
- Behaviour of structures constructed from composite materials.

Sustainable buildings and materials

- Usability of recycled materials for sustainable building products and to enhance their structural properties
- Assessing the environmental impact of structures: carbon footprint or embodied energy
- Environmentally efficient and sustainable design methodology for concrete residential and office buildings.
- Converting waste brown coal fly ash into sustainable building materials.

Teaching pedagogies

- Assessing individual learning in team based pedagogies
- Improving modeling and simulation capability of engineering students in three dimension space problems.

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TELECOMMUNICATIONS, ELECTRONICS, PHOTONICS AND SENSORS



The Telecommunications, Electronics, Photonics and Sensors Faculty Research Unit conducts research in strategic areas of communications and sensor technology, thereby addressing the ongoing requirements of national and global industry and the demands of the information age.

RESEARCH

The Telecommunications, Electronics, Photonics and Sensors Faculty Research Unit has three foci:

Telecommunications

Research is concentrated into the area of wireless systems and related applications:

- Radio System Design, which involves the capacity and deployment of wireless systems;
- Air Interface Research, which involves the measurement and modelling of the radio channel and then the development of modulation schemes and algorithms to exploit or overcome the resulting channel characteristics; and
- Radio architectures and implantation (micro)-electronics.

Research Projects

- Green wireless base-stations, based on low power transmitter electronics.
- Frequency flexible circuits, including removal of switched filters from wireless handsets, and which requires close collaboration with our microelectronics capabilities.
- Cognitive radio, which means dynamic and opportunistic access to unused spectrum. Previously this research involved TV band modems but now includes femtocell systems (i.e. very small area wireless systems).
- "Body area communications", involving portable sensors for measuring physical activity in the lower limbs".

Microelectronics

The research involves the design of new integrated circuits for solving instrumentation problems and providing more efficient and effective signal processing, and including full-custom integrated circuits design, semi-custom and FPGA circuits design and MEMS/MOS sensors design.

Research projects involve applications in:

- Telecommunications research, since mobile communications requires new integrated circuits to be designed, fabricated and tested.
- The development of sensors for applications in sport and health science and biomedical engineering

Optics & Photonics

Research is conducted in the areas of optical fibre sensors, optical materials, optical fibre lasers & optical amplifiers and imaging of photonic devices.

Research projects involving one or more of these areas include:

- Optical fibre Bragg gratings are an optical filter inscribed within an optical fibre and work includes understanding the complexities of their behaviour, including sensor applications, and their application for tuning and switching applications relevant to optical networks.
- Deployment of optical fibre sensors in industrial situations, e.g. monitoring corrosion in water pipes.
- Rare-earth-doped optical fibres are vital for optical fibre lasers and optical amplifiers and improvement in their fabrication will allow enhanced performance, or better tunability.
- Applications in biosciences and health of optical techniques include imaging using the microscope and new applications of optical fibre sensors; e.g. imaging of single muscle fibres and the assessment of compression garments.

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WATER RESOURCES

We conduct research in major areas of water resource planning, integrated urban water management, hydrological modelling, water infrastructure and asset management, and river water quality modelling.

The Water Resources research group works closely with the Institute of Sustainability and Innovation, water industry and several Australian and overseas universities.

WATER RESEARCH PROJECTS

We are investigating sustainable ways of improving water use efficiency and productivity by developing methods and techniques for:

- Allocating water
- Protecting rivers and streams
- Reusing stormwater and wastewater
- Managing demand
- Managing water assets.

WATER RESOURCE PLANNING

We conduct research into water supply and demand focusing on ecological and environmental needs of rivers and streams. Our current research in water resource planning includes:

- Potential impact of climate change on water resource systems
- Meeting consumptive uses of water through efficient and equitable sharing of water resources
- Streamflow generation techniques (e.g. using remote sensing data)
- Sustainable river basin management
- Protection of integrity and sustainability of ecosystems.

INTEGRATED URBAN WATER MANAGEMENT

Our research focuses on meeting the needs for water services to cater for projected increase in population and rapid urbanisation. Our current research in integrated urban water management includes:

- Stormwater opportunities for urban development

- Short-term non-residential urban water demand modelling
- 'Third pipe' issues using stormwater and recycled water
- Alternative water sources, including rainwater, reclaimed and treated water

HYDROLOGICAL MODELLING

We use hydrologic models (conceptual and black box or data-driven models) for flood forecasting and predicting catchment streamflow in urban areas. Our current hydrological modelling research includes:

- climate change and urbanisation impacts on urban drainage systems
- short term forecasting of hydroclimatic variables
- statistical downscaling of General Circulation Model (GCM) outputs to catchment level hydroclimatic parameters

WATER INFRASTRUCTURE AND ASSET MANAGEMENT

We are researching ways to efficiently and cost-effectively upgrade Australia's aging water infrastructure. Our current research in water infrastructure and asset management includes:

- deterioration models for stormwater pipes
- asset management of sewers and manholes

- climate change and urbanization impacts on urban drainage systems
- monitoring corrosion in water mains using in-situ sensors
- impact of source management practices on septicity in sewerage pipe networks

RIVER WATER QUALITY MODELLING

Rivers can provide valuable supply of drinking water for humans, irrigation water to farmlands, water for hydropower and home for many aquatic ecosystems. Our current research in river water quality modelling includes:

- agricultural non-point source pollution
- septic tank pollution of rivers
- improving river water quality (considering point and non-point source pollution)
- river water quality index development

CONTACT US

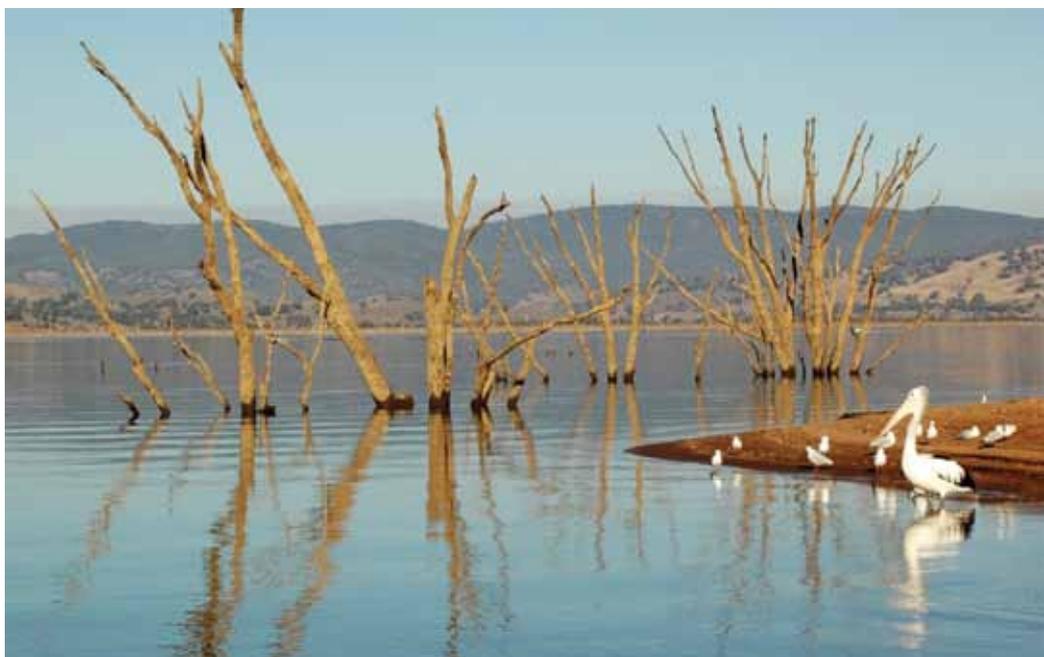
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INSTITUTE FOR SPORT, EXERCISE AND ACTIVE LIVING

Institute of Sport, Exercise and Active Living (ISEAL) is the future of sport and science, and represents a new era of research and engagement in sport, exercise and active living.

Our expert team of internationally recognised researchers and postgraduate students undertake multidisciplinary research in:

- High performance (elite) sport
- Community and grassroots sport, physical activity and active living
- Basic (fundamental) research in exercise sciences
- Applied research in social and management sciences

KEY RESEARCH AREAS

We conduct research in the three programs of sport, exercise science and active living.

Sport

Sport is a vital part of Australian society and an important part of the social and cultural fabric of nations around the world.

Our program involves high performance and innovative research that benefits elite athletes and their coaches. We also strive to understand the role of sport in developing vibrant, healthy communities in Australia and overseas.

Our academics specialise in the areas of:

- Sport science
- Sport business and management
- Sport tourism
- Community sport
- Sport in society
- Culture and sport

Exercise science

Exercise science is the scientific study of human movement and its disciplines. Our program is the bridge between sport and active living.

It is central to the public health sector, elite sports and related industries, such as the manufacturing of sporting apparel, equipment and nutrition.

Our research will advance knowledge of exercise and the critical role it plays in all aspects of human (movement) behaviour. As a result, we will deliver new basic knowledge that will help government and sport and recreation professionals to maintain healthy and active communities.

Our research disciplines in this area include:

- Exercise and health
- Exercise biochemistry and molecular biology
- Exercise biomechanics
- Exercise metabolism and nutrition
- Exercise physiology
- Exercise psychology
- Exercise rehabilitation
- Motor learning and motor control

Active living

Active living is about integrating physical activity and sport into all stages of our life regardless of age or social and economic status.

We research factors that affect opportunities for people to engage in physical activity.

Much of our research aims to identify the reasons for varying physical activity levels, and ways of changing behaviours to create more healthy and sustainable participation in physical activity.

We conduct research into:

- Healthy populations
- 'At risk' populations
- Disability and chronic disease
- Active transport and active design
- Home and work environments

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INSTITUTE FOR SUPPLY CHAIN AND LOGISTICS



The Institute for Supply Chain and Logistics (ISCL) works collaboratively with the community, industry and government. Using our expertise in these areas, we focus on education and training, research, consulting and knowledge sharing.

We bring together government, industry and the resources of Victoria University in the development, support and facilitation of logistics 'know-how' to benefit Victorian, Australian and regional economies.

Our objective is to be the academic partner of choice for cutting-edge, practically oriented research and global practices in the areas of transport, logistics, supply chain, warehouse and distribution.

RESEARCH TOPICS

Research topics are classified in five main areas:

- Supply chain strategy
- Supply chain operations research
- Supply chain intelligence
- Supply chain interaction
- Supply chain technology

SUPPLY CHAIN STRATEGY

Supply chain strategy defines how the supply chain should operate in order to compete. It is an iterative process that evaluates the cost-benefit trade-offs of operational components. It includes the analytic and decision-making process surrounding what to offer (products and services), when to offer (timing, business cycles), and where to offer (markets and segments) as a competitive plan.

SUPPLY CHAIN OPERATIONS RESEARCH

Supply chain operations research can be classified into the broader operations research area, which includes many topics. Specifically, we look into research work in terms of:

- transportation and scheduling
- warehousing and inventory control
- mathematical modelling and programming
- queuing theory
- network optimisation

- forecasting and simulation
- demand management
- port operations
- logistics outsourcing
- food supply chain / cold supply chain
- logistics performance measurement

SUPPLY CHAIN INTELLIGENCE

Supply chain intelligence provides the capability to extract, sense, and analyse information about a supply chain. It enhances the ability to reason through business outcomes and prescribes the best course of action for focusing an organisation on the highest impact activities.

SUPPLY CHAIN INTERACTION

Supply chain interaction aims to manage the interactions among members of a supply chain so that smooth coordination and communication can happen across the supply chain. Maintaining a good working relationship across the supply chain provides business opportunities, while helping to be aware of and manage risks that might exist.

SUPPLY CHAIN TECHNOLOGY

Supply chain technology includes any technology development that is for supply chain management, can improve the performance of supply chains, or has the potential to be applied to supply chains.

Information and Communication Technology (ICT) applications have been the backbone for the information flow control of supply chains, enabling application for supply chain management and greatly improved supply chain performance.

Typical applications include:

- Enterprise Resource Planning (ERP) system
- E-commerce
- Online shopping

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INSTITUTE FOR SUSTAINABILITY AND INNOVATION

Research in the Institute for Sustainability and Innovations (ISI) promotes and enables sustainable outcomes for industry and the community, based on environmental and innovative technologies. We provide industry and community solutions in water treatment technology, resource management, asset management, social and behavioural research, and environment.

ISI has established capability in key water research areas. In collaboration with the associates we work in the areas of water treatment, water resource, ICT management, climate change impacts of water yield, data mining, asset management and ecology. ISI is also developing a sustainable energy research program

RESEARCH AREAS

Water is a major focus for Victoria University at both the research and education levels. We undertake applied research in drinking water, wastewater, recycled water, stormwater and industrial water applications.

We aim to provide industry and community solutions in the areas of water treatment technology, resource management, asset management and social and behavioural research.

IN THIS SECTION:

WATER TREATMENT

We develop and demonstrate water and wastewater treatment technologies at both the laboratory and pilot scale, including desalination and low pressure membrane systems.

SOCIAL AND BEHAVIOURAL ASPECTS OF WATER USE

This research is integral to ensure water requirements for communities are met despite fixed or declining water supply.

ASSET MANAGEMENT

We undertake research to develop deterioration models for stormwater pipe systems using innovative and noise-insensitive artificial intelligence techniques.

ENVIRONMENT

We research aquatic biota and quantitative assessments of the impacts of water use on aquatic ecosystems, as well as work on ecology and environmental remediation.

E-RESEARCH

E-research involves Information and Communication Technology (ICT) applications in areas such as environment and sustainability studies. We collaborate with the Centre for Applied Informatics (CAI) which is a leading academic research group committed to the development of innovative e-technologies.

WATER RESOURCE PLANNING

We conduct applied research to solve a wide variety of water engineering problems in collaboration with industry.

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INDUSTRY ENGAGEMENT AND COMMERCIAL ACTIVITIES

The Faculty of Health, Engineering and Science strives to work with industry, government and the community through research collaborations, provision of services, and technology transfer.

RESEARCH COLLABORATIONS

The Faculty undertakes collaborative research with industry, other research institutions, government agencies, and organisations throughout Australia and around the world. Collaborations with industry can be supported by ARC Industry Linkage Grants, or through other arrangements of mutual benefit to all parties.

SERVICES

The Faculty can provide a variety of services to various clients through its schools and research centres. We provide a range of initiatives, investment opportunities and services to help organisations achieve their goals.

CONTRACT RESEARCH AND DEVELOPMENT

Our research leads to the discovery of new knowledge and innovative technologies that can be applied to practical problems. Our researchers create new and improved products or processes in organisations, and our equipment, facilities and infrastructure are accessed to conduct tests and experiments that will benefit the industry. We can provide strategic advice and apply our research strengths to solve problems or develop expertise or new technologies in organisations from a variety of industries.

Our contract research and consulting services teams provide the following services:

- Strategic advice on how our research strengths can assist

- Collaborative research or research partnerships (including ARC linkage grants)
- Commissioned research
- Testing and analysis
- Access to university equipment, facilities and infrastructure
- Project management

COMMERCIAL OPPORTUNITIES AND INVESTING IN RESEARCH

We are continually developing new knowledge and innovative technologies with the potential for commercial development with industry partners. If you are an investor or are interested in finding out about opportunities to collaborate with us to grow your organisation by using our technologies, please contact us to find out more.

CONSULTANCY

Our business development and research teams provide specialised consultancy to help organisations achieve their goals. We provide tailored training solutions and specialist expertise to help develop staff capabilities and grow organisational capacity. We will work with organisations to:

- Identify opportunities to work together on initiatives, including research that leads to innovative technologies and solutions
- Assess organisation's readiness for change
- Assess the gap between existing and desired performance of staff
- Assess the current knowledge, skills and attitudes of staff and those needed to achieve the organisation's goals
- Design and tailor training solutions to address the performance gap
- Measure and evaluate the benefits of investment in training
- The faculty is particularly strong in

providing services that are based on years of research expertise through its research centres

TECHNOLOGY TRANSFER AND INVESTMENT:

Licensing Opportunities

The Faculty is continually developing new technologies and processes that are available for licensing or commercialisation.

The University is currently seeking expressions of interest for investment capital or licensing and invites interested organisations or individuals to contact the Office for Innovation and Commercial Development.

ENQUIRIES SHOULD BE DIRECTED TO

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RESEARCH SOLVING REAL LIFE PROBLEMS

DOES CAPTIVE BREEDING INDUCE BRAIN SIZE REDUCTION IN MARSUPIALS?

Dr Patrick-Jean Guay and
Dr Randall Robinson

Captive breeding followed by re-introduction to the wild is a common component of conservation management plans for threatened species in Australia and abroad. Unfortunately, captive breeding has been shown to result in both behavioural and morphological changes in many taxa.

One change associated with captive breeding is a reduction in brain size. This change has been observed in mammals and birds but has never been studied in marsupials. Reduction in brain size has also been observed in domestic animals and is associated with important changes in behaviour.

Captive breeding has been suggested to correspond to the initial stage of domestication and the decreased brain size associated with captive breeding is likely to result in behavioural changes. This may explain why re-introduction programs have only been met with limited success in marsupials and animals in general.

A large number of species of marsupials are declining in Australia and many of them, including Tasmanian devils, mountain pygmy-possums and eastern barred bandicoots, are being bred in captivity as a source of animals for re-introduction. It is therefore crucial to evaluate the suitability of breeding programs to maximise re-introduction success. Various strategies including decreasing the number of generations in captivity and providing an enriched environment have been suggested to decrease the impacts of captive breeding, but the efficacy of these strategies to inhibit brain size decrease has never been tested.

In a recent study published in *Zoo Biology* that was conducted in collaboration with The University of Melbourne and Zoo Victoria, Patrick-Jean Guay and Randall Robinson from the Applied Ecology Research Group have studied the impacts of captive breeding over a low number of generations (2-7) in an enriched environment in the Stripe-faced Dunnart, a small mouse sized marsupial, to determine if brain size could be maintained under these conditions.

Their results clearly demonstrate that brain size atrophy is preventable if the animals are kept under suitable conditions. The results

of this study have attracted interest from various zoos because they open the way to test captive breeding programs for their suitability for re-introduction. Consequently Patrick-Jean Guay and Randall Robinson will conduct a study on the impact of captive breeding on an Australian iconic species, the Tasmanian devil.

The species has been decimated by the facial tumour disease and extensive captive breeding programs have been initiated to provide insurance populations should the species become extinct in the wild. This work, conducted in collaboration with Zoo Victoria, the Zoo and Aquarium Association and the Save the Tasmanian Devil Program, will determine whether the Tasmanian devil captive breeding program adequately protects the animals from brain size reduction. This will ensure that the resultant captive population will be suitable for re-introduction programs should the need arise in the future.

Zoos Victoria aims to be the world-leading Zoo Based Conservation Organisation. Our conservation activities centre on preventing the extinction of species both in Australia and abroad. We are committed to high-quality research aimed at improving all aspects of our threatened species breeding programs. We are delighted to be collaborating with Victoria University on this important investigation into the potential impacts of captivity on brain size in the iconic Tasmanian devil. Outcomes from this work will inform the way we manage our devils at Healesville Sanctuary and, more broadly, help ensure the long-term health of the national Insurance Population.

Dr Michael Magrath,
Senior Scientist, Zoos Victoria





LEADING THE WAY IN FIRE SAFETY

Professor Dorothy Bruck and
Dr Michelle Ball

We can learn a lot about increasing home fire safety by closely examining the circumstances of those who have died in house fires. We can learn more if we can compare this information with details about those who have survived a serious residential fire.

Over recent years staff from the VU Centre for Environmental Safety and Risk Engineering (CESARE) and the School of Social Sciences and Psychology has established a database with details from coronial files about those who have died in fires.

Professor Ian Thomas, was the key driver of the initiative and we are continuing to build up the VU Coroner's Fire Fatality Database to cover multiple Australian states.

To date this rich resource has yielded nine papers and provided ground-breaking insights into risk factors. We are also in the process of developing a Home Fire Survivor's Database, based on extensive individual interviews on people who have survived a serious fire.

The importance of those two resources has been recognised by key agencies and cash and in kind support has been forthcoming. Grants totalling \$147,000 over three years have been secured from Metropolitan Fire Brigade (MFB), Country Fire Authority (CFA)

and the Office of the Emergency Services Commissioner for the further development and analysis of those two databases. The Bushfire Cooperative Research Centre is also supporting VU PhD candidate Erin Doolan with a scholarship to undertake her study on the risk of death in fire for people with a mental illness or who are socially at risk using the coroner's database.

This work follows on from our association with the two local fire agencies through two successful ARC Linkage Grants. These have focussed on the evaluation of an educational program run by the MFB and CFA for children who have a history of fire setting.

PREVENTING THE EXTINCTION OF BOTTLENOSE DOLPHINS

Ms Nicole Filby and Dr Carol Scarpaci

Nicole Filby's research aims to help protect the vulnerable bottlenose dolphins of Port Phillip Bay. She is undertaking her PhD at Victoria University with the Marine Ecology Research Group. Her research examines two facets of the dolphins: their behaviour, acoustic communication, photo-identification, distribution, habitat and their interaction with the dolphins-swim-tourism industry. Nicole explains that, "proper management and protection of species and ecosystems requires an understanding of their underlying biology and ecology and often available information is sufficient for this task".

The population of bottlenose dolphins in Port Phillip Bay is considered vulnerable

to extinction due to its small size, genetic distinctiveness, restricted home range, female natal philopatry, high levels of human activity in the area, and a non-compliant commercial dolphin-swim industry. Nicole hopes her research will ensure that the dolphins in Port Phillip Bay remain protected, enabling future generations the opportunity to view and interact with these creatures.

Conservation of the genetically unique population of bottlenose dolphins that inhabit Port Phillip Bay is Nicole's main priority. This means gaining baseline information on their behaviour, life history and habitat use. A small part of her research is looking at the behaviour of a colony of Australian Fur Seals living on Chinaman's Hat, Port Phillip Bay. "My research aims to raise awareness with the general population about the ways they can help conserve the environment and increase their knowledge of our marine environment".

Nicole is enthusiastic about the time her research allows her to spend out on the water. "Each day out in the field brings something different, whether it is an encounter with the little blue penguin that pops up next to the research boat or witnessing a pod of whales being harassed by sharks".

Nicole studied marine biology at Monash University as part of her undergraduate studies and immediately decided this was where her future career would lie. Her honours project focussed on common dolphins in South Australia, working with the Whale and Dolphin Conservation Society, investigating the "The distribution abundance and photo-identification of common-dolphins (*Delphinus delphis*) within St Vincent Gulf, South Australia". From where Nicole worked on a number of different research projects, including research on humpback whales and common, bottlenose and hectors dolphins.

"I am passionate about dedicating my future career to research that focusses on the conservation of Australian marine animals, as well as continuing to learn more about what their behaviour and acoustic communications can tell us".

DESALINATION RESEARCH

Dr Nicholas Milne and
Dr Shobha Muthukumaran

Victoria University researchers have received almost \$2.7 million in grants from government and industry partners for three innovative desalination projects. The projects will focus on improving efficiency in groundwater desalination techniques, industry guidelines for regulators and policy makers and prevention of biological fouling during desalination. Biological fouling is the undesirable accumulation of microorganisms, plants and algae in water systems.

Dr Nicholas Milne of Victoria University's Institute of Sustainability and Innovation said improving desalination technology was important to save water and money. One project will investigate more effective treatment of water before and during filtration of brackish water extracted during coal seam gas mining, so a higher percentage of groundwater can be reused rather than left in evaporation ponds. "In Australia, desalination is necessary of groundwater in most cases so it is important we use as much of that water as possible

rather than 25 per cent to 40 per cent of it going to waste, as is currently the case", Dr Milne said.

The National Centre of Excellence in Desalination Australia grants were part of \$3.8 million for 11 new desalination research projects across Australia, with Victoria University involved in more projects than any other university. Institute for Sustainability and Innovation Director, Professor Stephen Gray, said it was a welcome acknowledgement of Victoria University's leading role in the development of desalination technology. "It is an important announcement to VU because we are one of the largest membrane research groups in Australia and we have a strong research focus on its application of desalination", he said.

The University's project partners include Origin Energy, Grampians Wimmera Mallee Water and the Smart Water Fund. Parliamentary Secretary for Sustainability and Urban Water, Senator Son Farrell, announced the successful projects earlier this month at the opening Australia's first dedicated national desalination research facility and Desal Discovery Centre in Perth.



REDUCTION OF CARDIOVASCULAR DISEASE

Dr Anthony Zulli

In three years at VU Dr Anthony Zulli has established himself as the university's expert on cardiovascular disease research. Based at the biomedical research labs of Sunshine Hospital, Dr Zulli is currently working on two long-term studies to reduce cardiovascular disease – the biggest killer of elderly Australians.

One study is looking at the ability of Mas receptors to restore normal blood vessel functions and reduce disease. "A lot of drugs for cardiovascular disease are already working indirectly via this receptor, so we want to understand exactly what these receptors are doing", Dr Zulli says.

A receptor is a protein that, once activated, will send a signal to a cell to do something. Another study, which Dr Zulli presented at this month's Australian Vascular Biology Society conference in Sydney, is looking at which cells are recruited to blood vessel disease. "If we can identify which cells are responsible for healing blood vessels, then we can look at converting a diseased blood vessel back to normal", he says.

Dr Anthony Zulli is also looking at cardiovascular health, from a more preventative angle, through the advantages of the Mediterranean diet. The Mediterranean diet – heavy in seafood and vegetables – is high in Taurine. Dr Zulli says most of us do not get enough Taurine in our diet as we do not eat enough fish, and is looking at the ways to introduce it into the junk food to make it less harmful. "You are not going to stop people eating junk food because it is easy and tasty – but let's make it less harmful", he says.

Dr Zulli also says Taurine is cheap and non-toxic, while his initial studies showed adding Taurine to junk food led to around 60 per cent reduction in coronary artery diseases compared to junk food without Taurine, with results published in a high ranking journal established by American Heart Association.

STATE'S MANGROVES AND SALTMARSH UNDER THREAT

Professor Paul Boon

Victoria's mangroves and saltmarshes are misunderstood by land managers, undervalued by public and under threat from rising sea levels and coastal development, according to Professor Paul Boon.

A major four year study by Professor Boon, from Victoria University's Institute of Sustainability and Innovation, shows human impacts and development have destroyed up to twenty per cent of the state's coastal marshes, while the future looks even bleaker. Professor Boon said predicted sea level rises would push these systems inland, while their retreat would be blocked by seawalls, farmland and housing developments along much of the coast. "These saltmarshes with nowhere to go will simply drown", he said.

Mangroves and saltmarshes are important breeding ground for birds, fish and other marine estuarine species, protect against erosion and provided filtration of runoff from the land. Saltmarsh in Western Port despite this, mangroves and saltmarshes are not referred to specially under Victorian Legislation for Protection.

Disturbingly, the knowledge of mangroves and coastal saltmarsh across different management agencies is patchy and the management of these areas is poorly coordinated.

Meanwhile surveys of the public in Torquay and Tooradin found knowledge of the environmental role fulfilled by saltmarshes by the broad public to be almost non-existent. "Saltmarshes are largely unknown and therefore invisible to the community", Professor Boon said. "Most people saw saltmarshes as little more than muddy, smelly breeding grounds for mosquitos". Mangroves, with their more obvious vegetation and possible links with recreational fishing, had a slightly higher profile than saltmarshes but remained unpredicted by almost everyone, except fishermen who recognised their importance for angling.

Recommendations in the five hundred page report include the reservation or purchase of environmental land to support the inland retreat of mangroves and saltmarshes, new buffer zones to coastal development and the creation of a single body to coordinate management of the state's mangroves and saltmarshes.

This study included the first fine-scale mapping of all current mangroves and saltmarshes in Victoria, as well as an analysis of the likely coverage before European colonization in Victoria.

It shows how up to half the mangroves and saltmarshes around Port Phillip Bay and Western Port were cleared for housing and port developments, with many mangroves in other areas around South Gippsland burnt to produce ash for soap-making in the 19th century.



RESEARCHER PREDICTS DROUGHT

Dr Shishutosh Barua

Knowing when to instigate water saving measures in dry times will be easier following a breakthrough in drought prediction by Victoria University researcher. Water engineer Dr Shishutosh Barua has developed a way to predict droughts six months before they begin.

The new model was part of his PhD study of Melbourne's major water sources, the Yarra River catchment. The tool he developed measures several water and climatic variables to assess dryness in an area and then uses past circumstances to predict future drought conditions. "The tool is capable of forecasting drought conditions six months in advance", Dr Barua said. "This early detection of droughts will help water managers to implement drought mitigation strategies and measures before droughts occur".

As part of the study, Dr Barua also used his model to accurately detect past major historical droughts in Victoria.

He said previous prediction models focussed on rainfall deficiency but that his model also measured water storage, streamflow, water in the soil and evaporation to gain broader and more accurate assessment of a catchment's dryness.

Dr Barua said the recent thirteen-year drought showed how vulnerable we were to water shortages in Australia and said he hoped his tool would allow governments and water authorities to better prepare for the next inevitable drought.

"There have been frequent droughts in the past 60 years and there will be more frequent droughts in the coming years according to the climate change scenario analysis", Dr Barua said. "I hope this tool can be used to forecast future drought conditions and useful for water managers to plan ahead the water management activities during droughts".

THE WAY TO A HEALTHIER HEART

Dr Regina Belski

The way to a healthier heart could be as simple as changing the type of flour in the foods we eat.

Victoria University dietitian Dr Regina Belski has conducted a 12-month study of 130 overweight but otherwise healthy people, undertaken alongside researchers from the University of Western Australia and The Centre for Food and Genomic Medicine, found participants who ate bread, pasta and biscuits in which normal wheat flour was partially replaced with lupin flour had a lower risk of developing heart disease.

"It shows that by making a simple change in food choice we can see direct health benefits like a decreased risk of heart disease," Dr Belski said.

Dr Belski said 85 per cent of the world's lupin supply was grown in Australia, but most was exported or used as stock feed.

"However, following the discovery of its potential health benefits for humans, its use in human foods is beginning to take hold,

with lupin bread now being commercially available in Western Australia," Dr Belski said. "It's exciting that we could be looking at a much healthier population using a resource that is abundant in Australia."

Bread made with Lupin flour is yellow in colour and denser than regular bread.

Dr Belski said previous short-term studies had indicated that lupin bread had the potential to aid weight loss because it was more filling and reduced the amount of food people ate at their next meal.

The heart health benefits observed in Dr Belski's study included effects on insulin sensitivity, important for preventing the development of Type 2 diabetes. This has led to further research exploring the benefits of lupin flour for individuals with Type 2 diabetes.





STIGMA ADDS TO BURDEN OF PSYCHOSIS

Professor Terence McCann

The stigma of psychosis is isolating carers and making them more reluctant to access crucial support, especially in migrant communities.

Professor Terence McCann explored how caregivers of young adults with first-episode psychosis in 20 Melbourne families coped with the stigma of mental illness.

“For relatives and caregivers of people with mental illness, stigma affects many aspects of their already burdened lives, with friends avoiding not only the person who is ill but also the person’s caregivers,” Professor McCann said.

The study found some carers, particularly those from migrant backgrounds, chose secrecy and isolation rather than face the rejection, embarrassment or loss of status they feared in the community.

“Some caregivers simply shut themselves off from others,” Professor McCann said. He said this approach could have troubling repercussions. “Secrecy precludes the caregiver and the young person from receiving crucial support from others, it reinforces their social isolation and alienation from friends and neighbours, and for caregivers in particular, it heightens their overall burden of care,” he said. “Secrecy may also mean the caregiver is more

reluctant to access timely care for the young person.”

He said the secretive approach to mental illness among migrants was consistent with previous research in which Chinese-Canadian caregivers were more secretive about psychosis than European-Canadian caregivers.

Professor McCann said those who took an open approach with family and friends generally found it lessened their burden. Family support ranged from discussing how to assist the young person to providing emotional support and sharing responsibility for care, he said.

Openness with friends created a situation where carers felt they were being listened to and cleared the way for emotional and practical support.

Professor McCann said it was not only carers who could benefit from an open approach. “For young people, openness and contact with others enable them to obtain greater support and acceptance from a wider range of people,” Professor McCann said. “From a community perspective, openness and contact with young people with a first episode of psychosis can help de-stigmatise the illness.”

He said casual interactions with young people suffering psychosis or helping them take steps to get back to a relatively normal life were important in reducing the isolating effects of stigma.

RESEARCH EXPERTISE STAFF PROFILES

**SCHOOL OF BIOMEDICAL
AND HEALTH SCIENCES**



DR SWATI BAINBUR-HUDSON

Areas of Expertise: Biomedical Science, Biochemistry, Molecular Biology, User Bioinformatics.

Research Interest: DNA and diversity, Telomeres, ageing and cancer, Molecular basis of cancer

Current Projects: Investigation of the use of DNA in prediction of age, Telomere length variation and Mitochondrial mutations, Biodiversity determination using molecular methods, Investigation of the use of CDX1, CDX3, p53 expression as predictors of gastric cancer progression

Industries: Biomedical Science, Education, Health Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR MATT COOKE

Areas of Expertise: Muscle Physiology Muscle Metabolism Metabolomics Aging Obesity

Research Interest: Resistance training and nutritional interventions on the physiological adaptations and biochemical mechanisms regulating skeletal muscle atrophy associated with aging, Nutritional supplementation and/or varied training regimes to manipulate normal and abnormal molecular signaling mechanisms and gene expression in athletes and disease/injury states, Exercise training and nutritional interventions on weight loss, weight maintenance, and metabolism in healthy and diseased populations

Current Projects: Understanding the Role of Exercise Intensity in the Regulation of Muscle Metabolism in Type 2 diabetics: A NMR-Based Metabolomics Approach, Optimising Feeding Strategies to Overcome "Anabolic Resistance" and Augment Resistance Exercise Adaptations in the Elderly

Industries: Biomedical Science, Community Health, Health

Research Strength: Diversity and Wellbeing, Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



PROFESSOR GREGORY BLATCH

Areas of Expertise: Biomedical Biotechnology, Biochemistry

Research Interest: Broad field of cellular stress biology - focus on the role of molecular chaperones and co-chaperones in disease and infection

Current Projects: A number of projects are currently active focusing on the role of molecular chaperones and co-chaperones in disease (cancer and cancer stem cells) and infection (malaria and trypanosomiasis)

Industries: Biomedical Science, Health

Research Strength: Diversity and wellbeing

Faculty Research Group: Biomedical and Lifestyle Diseases



DR CRISPIN DASS

Areas of Expertise: Cancer Research, Drug Delivery, Formulation Technology

Research Interest: Cancer Gene Therapy, Cancer Molecular Therapy, Nanotechnology

Current Projects: Post-cancer stem cell-mediated tissue regeneration, Nanoparticle-mediated siRNA cancer therapy, Mining for potential drug candidates in marine species, Chitosan as an anticancer agent, PEDF peptidomimetics and cancer therapy, The uPA/uPAR system and cancer biology and therapy, RECK and tumour angiogenesis and metastasis, Formulation of scaffolds for tissue regeneration

Industries: Biomedical Science, Education, Chemistry (physical, polymer, analytical)

Research Strength: Sport performance, exercise science and active living



DR NICOLETA DRAGOMIR

Areas of Expertise: Biophotonics, Phase imaging, Optical sensing including fibre sensors, Optical devices and systems, Experimental optics, Materials characterisation

Research Interest: Development of novel optical imaging technologies, Biomedical optical imaging and sensing, Advanced multidimensional light microscopy to probe living cells, Three-dimensional structural dynamical processes, Polarised light imaging, Optical fibre sensors

Current Projects: Quantitative polarisation phase microscopy, Structural and micromechanical quantitative assessment of collagen in arteries, Confocal immunofluorescence imaging of unfixed single muscle fibres, Next generation equipment for compression garments assessment.

Industries: Biomedical Science, Education, Health, Photonic and Optoelectronic, Science

Research Strength: Communication and sensor technologies, Diversity and wellbeing, Sport performance, exercise science and active living

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors, Biomedical and Lifestyle Diseases, Advanced Food Systems



ASSOCIATE PROFESSOR ALAN HAYES

Areas of Expertise: Muscle contraction, Muscle biochemistry, Exercise physiology

Research Interest: Muscle contraction and metabolism, Exercise physiology, Muscle mass and ageing, Muscular dystrophy, Diabetes, Calcium and mitochondria.

Recent or Current Projects: Muscle mass matters Whey protein in resistance training and ageing, Exercise as a strategy for weight loss, Metabolic dysregulation in muscular dystrophy, Improving recovery from muscle damage, Dietary supplementation and muscle function in diabetes.

Industries: Health Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR GARY FRYER

Areas of Expertise: Osteopathic principles, Osteopathic technique.

Research Interest: Neurobiological mechanisms of osteopathic manipulative therapy, treatment and management of spinal pain, Use of manipulative techniques by the osteopathic profession, Effect of pain on motor recruitment and performance.

Current Projects: The effect of osteopathic manipulative technique application on EMG activity in the deep and superficial thoracic paravertebral muscles, The effect of osteopathic manipulation on the lumbar flexion/relaxation and responses to postural perturbations in low back pain subjects, Resting EMG activity of deep thoracic transversospinalis muscles identified as abnormal with palpation, The use of spinal and sacroiliac joint procedures within the British osteopathic profession.

Industries: Health, Osteopathy

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



ASSOCIATE PROFESSOR MICHAEL MATHAI

Areas of Expertise: Obesity, Diabetes, Thermoregulation, Heat stress, Fever, Nutrition, Osmoregulation, Maternal influences on perinatal development

Research Interest: Obesity and diabetes - nutrition and supplementation, Thermoregulation and fever, Telephone applications that support community health, Cardiovascular disease, Perinatal diet and health.

Current Projects: Dietary supplementation with tocotrienols inhibits the development of obesity-associated disease, The role of the hormone angiotensin in obesity, Using mobile phones to assist the management of chronic conditions, Central control of body temperature, Prevention of fibrosis using tocotrienol forms of Vitamin E.

Industries: Food and Dairy, Health

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR ANDREW MCAINCH

Areas of Expertise: Obesity and Diabetes, Dietary and Exercise modifications for the treatment of disease

Research Interest: Dietary and exercise modifications for the treatment of disease states particularly obesity, diabetes and related co-morbidities, The utilisation of human primary skeletal muscle cell cultures and associated research techniques for the investigation of obesity and diabetes related abnormalities.

Current Projects: Adaptive changes in genes, enzymes, fuel storage and leptin, adiponectin and endocannabinoid signalling in skeletal muscle utilising cell culture, animal and human models, Adaptive changes in humans following dietary and exercise manipulations, Use of the latest mobile phone technology as an educational tool to promote improved food choices.

Industries: Biomedical Science, Dietetics, Health, Nutrition, Molecular Sciences

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR PATRICK MCLAUGHLIN

Areas of Expertise: Biomechanics, Statistics, Research design

Research Interest: Biomechanics of techniques (performance improvement and injury prevention), Postural stability, Developing research methods that support evidence based (manual) medicine in Osteopathy and the health sciences, Effect of diabetes on feet, Compression garments.

Current Projects: Development of next generation measurement technologies for compression garments, Measuring load in the cast wall of total contact casts worn by diabetic patients, Using cluster analysis methods to identify golf putting techniques.

Industries: Health

Research Strength: Sport performance, exercise science and active living



PROFESSOR GLENN MCCONNELL

Areas of Expertise: Exercise metabolism, Exercise physiology, Exercise biochemistry

Research Interest: Examination of the regulation of skeletal muscle glucose uptake during exercise, The factors regulating the increase in insulin sensitivity and muscle mitochondrial volume following exercise, Whether exercise early in life can normalise insulin action in adult rats that were born small.

Current Projects: Regulation of skeletal muscle glucose uptake during exercise: role of nitric oxide, Regulation of the increase in skeletal muscle mitochondrial biogenesis after exercise, Is skeletal muscle nitric oxide production during exercise required for the increase in insulin-stimulated glucose uptake after exercise?

Industries: Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR VIJAY MISHRA

Areas of Expertise: Food Science and Technology, Separation processes and operations, food property measurement and modeling, functional foods and nutraceuticals, shelf life of foods, Grains and fruit and vegetable processing

Research Interest: Functional foods and nutraceuticals, design and development of separation processes, Minimal processing of foods, Processing aspects of cereal grains, Fruits, Vegetables.

Current Projects: Exopolysaccharides from bacteria, Antioxidants in fruits and vegetables, Beta glucans, Separation processes, Minimal processing of foods, Delivery mechanisms, Non-conventional heating methods, Property measurement and modelling, Food emulsions.

Industries: Food and Dairy, Science, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Advanced Food Systems



DR KULMIRA NURGALI

Areas of Expertise: Neuroscience, Enteric Nervous System, Electrophysiology, Ion Channels, Gastrointestinal Inflammation.

Research Interests: Effects of inflammation on the enteric nervous system, Inflammatory Bowel Disease, Post-infection Irritable Bowel Syndrome, Ion channels, Axonal damage and neuronal death, Side effects of chemotherapy on the enteric nervous system.

Current Projects: The roles of ion channels in neuronal hyperexcitability caused by intestinal inflammation, Neuronal death and axonal damage following intestinal inflammation, Triggering mechanisms of neuronal hyperexcitability following intestinal inflammation, Functioning of enteric neurons in acute stage of intestinal inflammation: from animal models to humans, Effects of colorectal cancer and chemotherapy on the enteric nervous system.

Industries: Health

Research Strength: Diversity and wellbeing



DR DANIEL OTIENO

Areas of Expertise: Food Chemistry, Food Safety and Quality, Polyphenols analysis, Protein or enzyme assay, Probiotic and pathogenic bacteria, propagation, enumeration and enzyme extraction, Functional organic compounds

Research Interests: Exo-polysaccharides in Dairy products, Prebiotic synthesis from various substrates, Probiotics and Enzyme reactions, Biotechnology and Bioprocessing Engineering, Biomass pretreatments and conversions into Bioproducts, Isoflavone biotransformation and other bioactive compounds, Functional ingredients and other organic compounds

Current Projects: Exopolysaccharide production in yoghurt, Microbial genomics in relation to capsular EPS production and physico-chemical characteristics of products.

Industries: Biotechnology, Food and Dairy, Nutrition

Research strength: Sport performance, exercise science and active living, Sustainable environmental technologies.



DR KYLIE O'BRIEN

Areas of Expertise: Chinese medicine education and curricula development

Research Interests: Chinese medicine, Herbal medicine, Acupuncture, Cardiovascular disease, Research into teaching & learning.

Current Projects: Investigation of efficacy of Chinese herbal medicine in treatment of symptoms of osteoarthritis, Reliability of Chinese medicine diagnosis, Preparedness for clinical practice of Chinese medicine students and graduates.

Industries: Chinese Medicine, Health

Research Strength: Diversity and wellbeing, Education, access and transition



DR EVA-RACHELE PESCE

Areas of Expertise: Protein-protein interactions, Protein folding, Molecular chaperones and stress proteins, Malaria biology

Research Interests: The role of Hsp70 and Hsp40 molecular chaperones in *Plasmodium falciparum*, Identification of small molecule modulators of malaria Hsp70 proteins

Current Projects: The role of Hsp70 and Hsp40 molecular chaperones in *Plasmodium falciparum*, Identification of small molecule modulators of malaria Hsp70 proteins

Industries: Biomedical Science, Biotechnology, Health, Molecular Sciences, Science

Research Strength: Diversity and Wellbeing

Faculty Research Group: Biomedical and Lifestyle Diseases



DR LATA RAMCHANDRAN

Areas of Expertise: Food proteins , Lactic fermentations, Membranes applications

Research Interest: Food proteins their structure, functionality and bioactivity, Lactic fermentations, Membranes in food processing and waste water treatment

Current Projects: Food proteins- structure-functionality relation

Industries: Food and Dairy, Manufacturing and Industrial, Science, Sustainability and Environment

Research Strength: Diversity and Wellbeing, Sustainable environmental technologies

Faculty Research Group: Advanced Food Systems



DR SAMY SAKKAL

Areas of Expertise: Immunology, T cell development, reproductive immunology, stem cell biology

Research Interest: Impact of pregnancy on thymopoiesis, Neuroimmunology, Stem cell biology

Current Projects: Neuro-immune interactions in anti cancer chemotherapy, Evaluating immune function in response to aerobic exercise and strength training

Industries: Biomedical Sciences, Science

Research Strength: Sport performance, exercise science and active living, Logistics and transportation

Faculty Research Group: Biomedical and Lifestyle Diseases



DR EMMA RYBALKA

Areas of Expertise: Duchenne Muscular Dystrophy, Mechanisms of skeletal muscle hypertrophy, atrophy and wasting, Muscle metabolism

Research Interest: Metabolism, mitochondria, metabolic enzyme function, metabolic signaling, hypertrophy signaling, autophagy, calcium regulation in muscle.

Current Projects: Is Duchenne Muscular Dystrophy a primary metabolic myopathy? The molecular mechanisms of muscle atrophy in Type II Diabetes.

Industries: Health, Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



PROFESSOR NAGENDRA SHAH

Areas of Expertise: Fermented dairy products, low fat mozzarella cheese, probiotic cheddar cheese, ACE-I inhibitory peptides, Physiology and health benefits of probiotics and enzymic biotransformation of soy isoflavones

Research Interest: Dairy Science: functional properties of milk, fermented dairy products, low fat mozzarella cheese, probiotic cheddar cheese, ACE-I inhibitory peptides, EPS producing stater cultures, Microbiology, physiology and health properties of Lactobacillus acidophilus, Bifidobacterium spp., and Lactobacillus casei, proteolytic activities of bacteria, bacteriocin, probiotics and prebiotics, and enzymic biotransformation of soy isoflavones.

Industries: Food and Dairy

Research Strength: Sustainable environmental technologies



DR DEANNE SKELLY

Areas of Expertise: Ion channels, Diabetes, Protein-protein interactions, Kidney function

Research Interest: Cell biology, Renal disease, Protein-protein interactions, Endocytosis.

Current Projects: Functional role of cannabinoid receptors in the kidney, Molecular signalling complex in proximal tubule cells, Macromolecular complex in renal endocytosis.

Industries: Health, Molecular Sciences, Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



PROFESSOR LILY STOJANOVSKA

Areas of Expertise: Women's health, Chronic diseases Complementary and alternative therapy, Improving quality of life through exercise.

Research Interest: Bioavailability and calcium absorption of cow's and soy milk in postmenopausal women, Prevention of chronic disorders, cardiovascular, osteoporosis and diabetes in postmenopausal women, Complementary and alternative therapy associated with postmenopausal health, Nutrition and diabetes associated with culturally diverse population.

Current Projects: Bioavailability and calcium absorption from dairy and non-dairy products in postmenopausal women, Complementary and alternative therapy associated with postmenopausal health, Nutrition and diabetes in culturally diverse population.

Industries: Community Health, Diabetes education management and training

Research Strength: Diversity and wellbeing, Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR CHRISTOS STATHIS

Areas of Expertise: Muscle biochemistry and metabolism, exercise biochemistry and metabolism, metabolism of macronutrients

Research Interest: Exercise metabolism, muscle metabolism and muscle physiology, Dietary supplements and nutrition for exercise and training protocol manipulations for maximal performance and increased energy expenditure for weight management, Investigating mitochondrial function in metabolism.

Current Projects: Physiological and biochemical responses following intermittent exercise, The influence of fasting on metabolic and protein signalling with intermittent exercise, The effect of beta alanine supplementation and bi-carbonate on maximal intermittent sprinting, Understanding energy metabolism with high intensity exercise.

Industries: Biomedical Science, Exercise Science, Health, Nutrition, Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR XIAO SU

Areas of Expertise: Food, Nutrition and Health

Research Interest: Lipids, Nutrition and Health

Current Projects: Analysis of omega-3 polyunsaturated fatty acid profiles in fish oil products, Effect of omega-3 polyunsaturated fatty acids on human osteosarcoma cell lines, Potential role of an Indian herb in obesity and metabolic syndrome treatment (animal model and human studies), Nutrition and lifestyle intervention and cardiovascular risk factors

Industries: Food and Dairy, Health, Science Biomedical Science, Food and Dairy, Health, Nutrition, Nutritional Therapy, Science

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases



DR ELIZABETH THYER

Areas of Expertise: Pathophysiology, Anatomy and Physiology, Paramedic Clinical Skills

Research Interest: E-learning, blended learning in paramedic students, Workplace transition, Pathophysiology, Cervical trauma, Paramedic intervention.

Current Projects: E-learning in distance education for paramedics, Incidence and management of cervical spine injuries in fatal road traffic accidents.

Industries: Paramedic Science

Research Strength: Education, access and transition



DR ELIZABETH VERGHESE

Areas of Expertise: Renal repair and Regeneration, Bone marrow derived cell repair, Role of cilia in repair

Research Interest: Primary cilia. They were previously ignored as vestigial but now are emerging as key regulators of signaling in development and tissue repair.

Current Projects: Cilium signaling in repair after ischemic renal injury, The role of cilia in repair and regeneration in muscular dystrophy, Cilia related repair mechanisms after Stroke, Cilium signaling in regeneration after Ischemic heart disease

Industries: Biomedical Science, Health, Nursing, Paramedic Science

Research Strength: Diversity and wellbeing, Sustainable environmental technologies

Faculty Research Group: Biomedical and Lifestyle Diseases



ASSOCIATE PROFESSOR TODOR VASILJEVIC

Areas of Expertise: Dairy Science and Technology, Food Rheology, Microbial and Enzyme Technology and Engineering, Physical Chemistry of Foods, Functional Foods.

Research Interest: Protein-protein and protein-polysaccharide interactions, Novel methods for preservation of bioactive materials, Intracellular enzymes from thermophilic lactic acid bacteria, Physiological properties of dietary proteins, Immunomodulating potential of probiotics in prevention and treatment of chronic diseases and metabolic disorders, Use of advanced membrane technologies in dairy processing.

Current Projects: The effect of dietary fish peptides on biomarkers of human health – the influence of processing conditions and the environment, Innovative zero - energy membrane technologies to reduce water consumption in the dairy industry, Improving cheese starter culture, Phase properties of encapsulation materials, Improvement of functional properties of whey proteins

Industries: Food and Dairy, Health, Manufacturing and Industrial, Science, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Biomedical and Lifestyle Diseases, Advanced Food Systems



DR ANTHONY ZULLI

Areas of Expertise: Biomedical Science

Research Interest: Stem cells in heart disease, Atherosclerosis, Diet and heart disease.

Current Projects: Dietary taurine and atherosclerosis, Stem cells in atherosclerosis, Taurine and heart disease.

Industries: Health

Research Strength: Sport performance, exercise science and active living

Faculty Research Group: Biomedical and Lifestyle Diseases

RESEARCH EXPERTISE STAFF PROFILES

**SCHOOL OF
ENGINEERING
AND SCIENCE**



PROFESSOR STEPHEN BIGGER

Areas of Expertise: Physical and Polymer Chemistry, Photo-Oxidation and Thermal Oxidation of Polymers, Polymer Stabilization, Chemical Education, Analytical Chemistry

Research Interest: Stability of plastics, Novel antimicrobial packaging materials, Non-isothermal chemical kinetics and its industrial applications, Low odour packaging materials.

Current Projects: Stability of plastics measured by accelerated ageing, thermo-analytical, chemiluminescence and oxygen uptake techniques, Natural antimicrobial agents for polymer films used in food packaging, Non-isothermal chemical kinetics and its industrial applications, Oil spill and wildlife remediation using magnetic polymer particles, Reduction of odour in and development of new plastics used for applications in food packaging

Industries: Chemistry (physical, polymer, analytical), Molecular Sciences, Science

Research Strength: Sustainable environmental technologies



DR DOMENICO CARIDI

Areas of Expertise: Chemistry

Research Interest: Fire investigation with arson investigation and the identification of ignitable liquid residues in fire debris, Waste management

Current Projects: Test burning of carpet and foam and the determination of potential interferences in identifying petrol in arson investigation, A study of flavonols in bok choy, their metabolites and anti-cancer properties, The effects of Different Feeding Regimes on the levels of fat soluble vitamins in bovine milk.

Industries: Chemistry (physical, polymer, analytical)

Research Strength: Sustainable environmental technologies, Diversity and wellbeing



PROFESSOR PAUL BOON

Areas of Expertise: Ecology and management of aquatic systems

Research Interest: Wetland ecology and management, Biology of aquatic plants, Biogeochemical cycles, Climate change

Current Projects: State-wide assessment of Victorian coastal saltmarsh, Mangrove ecology and rehabilitation, Ecology and management of Western Port and the Gippsland Lakes, Use of coastal wetlands for waste-water treatment, Natural and social history of the Hawkesbury River

Industries: Biomedical Science, Science

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Ecology



PROFESSOR PIETRO CERONE

Areas of Expertise: Mathematical modelling in a variety of areas. See research interests

Research Interest: Approximation and Error Estimation – Numerical / Computational analysis, Quadrature Rules, Divergence Measures, Information Theory, Probability Theory and Statistics and Analytic Inequalities, Mathematical Modelling, Financial Models and Option Pricing, Reliability and Maintenance, Population Dynamics – Stochastic Processes – Renewal Theory, Teletraffic Problems, Risk/Ruin Problems.

Current Projects: Approximation and Bounds in a variety of areas including risk/ruin problems actuarial science and populations, Initiatives in the Teaching and Learning of Mathematical Sciences and training of future teachers, Population dynamics modelling, Real world application of Mathematics.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Mathematics



DR MARLENE CRAN

Areas of Expertise: Polymer science with an emphasis on polymer membrane degradation. Nanotechnology

Research Interest: Degradation and service lifetime prediction of polymer materials, Integrity monitoring of reverse osmosis membranes for water treatment, Incorporation of natural antimicrobial additives in food packaging films

Current Projects: Vacuum decay testing of RO membrane elements, Reuse and recycling of RO elements, Development of real-time RO integrity monitoring system, Non-isothermal degradation of polymer materials, Investigation of chemically induced degradation and wear of polyamide RO membranes, Development of water recovery system for Metropolitan Fire Brigade, Development of novel food packaging materials containing naturally derived antimicrobial agents.

Industries: Manufacturing and Industrial, Sustainability and Environment, Transport and Logistics

Research Strength: Logistics and transportation, Sustainable environmental technologies

Faculty Research Group: Engineered Packaging and Distribution



ASSOCIATE PROFESSOR MIKEL DUKE

Areas of Expertise: Membrane based separations (desalination and filtration), Ceramic membranes, Membrane distillation, Membrane assisted fermentation

Research Interest: Water treatment, Desalination, Dairy processing, Materials engineering, Advanced sensor materials

Current Projects: Designing the surface and structural properties of MFI zeolite membranes for low energy ion-selective desalination, Development of advanced ceramic membranes: a robust solution to sustainable water treatment, Improving the durability and performance of hollow fibre membranes with Nano-composite and inorganic/organic hybrid materials, Innovative zero-energy membrane technologies to reduce water consumption in the dairy industry, Novel separation processes in the mining industry, Converting waste or solar heat to treated water, Review of zero liquid discharge, Remote Australia solar driven membrane distillation unit proof-of-concept.

Industries: Water treatment, chemicals production, foods processing

Research Strength: Sustainable environmental technologies

Faculty Research Group: Advanced Food Systems



PROFESSOR SILVESTRU SEVER DRAGOMIR

Areas of Expertise: Mathematical Inequalities and Applications

Research Interest: Numerical Analysis and Approximation Theory, Information Theory, Coding and Guessing, Probability and Statistics, Mathematical Analysis and Applications in Modelling

Current Projects: Numerical approximations of integrals with applications in Photonics, Divergence measures in Information Theory, Coding and Guessing, Gini Index and its applications in Economics and Wealth Distributions, Theory of Real Functions and Applications.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Communication and sensor technologies, Logistics and transportation, Sustainable environmental technologies

Faculty Research Group: Applied Mathematics



PROFESSOR MICHAEL FAULKNER

Areas of Expertise: Wireless communications, Telecommunication transmission systems, Radio frequency propagation, Antennas, Signal processing

Research Interest: Multiuser wireless communications

Current Projects: Software defined radio, Cognitive radio, Green base station architectures.

Industries: Electrical and Electronics, Science, Telecommunications

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



ASSOCIATE PROFESSOR SAM FRAGOMENI

Areas of Expertise: Structural Engineering

Research Interest: Analysis and design of concrete structures, Behaviour of high performance concrete-Shortening behaviour in tall buildings, Concrete in Fire

Current Projects: Differential shortening of vertical concrete elements in buildings, Damping behaviour of concrete beams, High strength concrete walls in fire, Behaviour of axially loaded concrete walls

Industries: Building, Construction and Architecture

Research Strength: Sustainable environmental technologies

Faculty Research Group: Structural Mechanics and Materials



DR PATRICK GUAY

Areas of Expertise: Waterfowl ecology, Conservation and population genetics.

Research Interest: Hybridisation in ducks, Human disturbance in birds, Ecology of waterfowl on waste water treatment lagoons, Conservation genetics of Australian Waterfowl

Current Projects: Impacts of changes in waste water treatment on behaviour of waterfowl, Hybridisation between Mallards and Pacific Black Ducks in Australasia, Impacts of human disturbance on waterbirds

Industries: Molecular Sciences, Science, Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Ecology



DR NIRDOSHA GAMAGE

Areas of Expertise: Structural Engineering

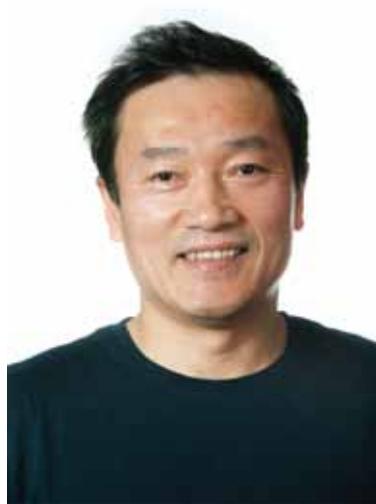
Research Interest: Cement based wood composite, Brown coal fly ash as a raw material for building products, Investigation of chloride affected bridges, Noise wall design.

Current Projects: Investigation of hardwood sawmill residues for particleboard production: process modelling and optimization using experimental design, Bridge infrastructure asset management, Noise wall design.

Industries: Building, Construction and Architecture, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Structural Mechanics and Materials



DR FUCHUN HUANG

Areas of Expertise: Spatial statistics, Non-smooth optimization algorithms, Time series modelling and forecasting

Research Interest: Spatial statistics, business and financial time series analysis, Data mining, Industrial system identification and control, Computational problems in biostatistics, Optimization algorithm

Current Projects: Non-smooth optimization algorithms and their applications in forecasting models.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



PROFESSOR AKHTAR KALAM

Areas of Expertise: Energy Systems

Research Interest: Power transmission and distribution networks utilising underground cables, Development of Smart Energy Systems, Artificial Intelligence and its application to Power Systems, Telecommunication in Power System Protection, Design and development of protection and control tools to enable the efficient and reliable use of cogeneration and renewable energy plants, Fuel cells and its application in cogeneration

Current Projects: Implementation of the IEC61850 International Protocol for Accurate Fault Location and Arc Voltage estimation in Overhead Power Lines, Advanced Transient Control of a Hybrid Solar/Diesel Electric Power System Medium High Voltage Power Cables Testing and Diagnostics, Direct Current based microgrid/distribution/power system/grid Integration of DG, Power Quality Issues in Electric Power Distribution System, Technical consideration and impact of converting overhead power lines to underground power cables

Industries: Electrical and Electronics, Energy and Utilities

Research Strength: Sustainable environmental technologies

Faculty Research Group: Smart Energy



DR HORACE KING

Areas of Expertise: Electronics, Remote Sensing and GIS, Telecommunications

Research Interest: Emerging Digital Telecommunication Technologies, Strategic Telecommunications Network Planning, Biomedical Engineering, Network Design, Management and Optimisation

Current Projects: Design of Low Power Digital Transmitters, Opportunistic Spectrum Access in Cognitive Radio Networks, Improved Cellular Networks through Cooperative coordination, Coexistence and spectrum sharing of LTE and DVBT, Digital Habitat Echo system Communication Architecture, 21st Century Wireless System Interoperability

Industries: Electrical and Electronics, Information and Communication Technology (ICT), Remote Sensing and GIS, Telecommunications

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



DR LUTFAR KHAN

Areas of Expertise: Production planning, staff planning, job scheduling, location and layout, inventory planning

Research Interest: Combinatorial Optimisation, Knapsack Problem, Bin Packing Problem, Travelling Salesman Problem, Cutting Stock Problem, Heuristic Algorithms, Evolutionary Computation, Modelling of Industrial Optimisation Problems

Industries: Information and Communication Technology (ICT), Manufacturing and

Faculty Research Group: Applied Mathematics



DR MATTHEW LAMB

Areas of Expertise: Signal Processing Random Data Mechanical Vibrations Packaging Dynamics Structural Integrity Assessment

Research Interest: Mechanical Vibrations Packaging Dynamics Structural Integrity Assessment

Current Projects: Development of a Structural Integrity Assessment technique for evaluating the performance of nonlinear packaging systems

Industries: Manufacturing and Industrial, Sustainability and Environment, Transport and Logistics

Research Strength: Logistics and transportation, Sustainable environmental technologies



DR DANIEL LAI

Areas of Expertise: Computational Modelling, Wireless Sensor Networks, Biomedical and Sports Technology

Research Interest: Body Sensor Networks, Intrabody Communications, Nanosensor Networks

Current Projects: Sensors and Actuators for Movement, Wireless Sensor Networks for Health, Human Body Channel Modelling for Intrabody Communications

Industries: Electrical and Electronics, Health Information and Communication Technology (ICT), Telecommunications

Research Strength: Communication and sensor technologies, Sport performance, exercise science and active living

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



DR WEE SIT LEE

Areas of Expertise: Systems Engineering

Research Interest: Control Systems, Telecommunication Systems, Biomedical Engineering, Signal Processing in Control, Telecommunications, and Biomedical Engineering.

Current Projects: A Iterative system identification and control for robust performance, Model predictive control of DC-DC converters, High performance model-based controllers for active magnetic bearing systems, Performance of telecommunication systems operating in fading channels, Detection of epileptic seizures in adults and infants, Signal processing algorithms for sensor networks.

Industries: Electrical and Electronics, Health, Information and Communication Technology (ICT), Telecommunications

Research Strength: Communication and sensor technologies



MR PETER LECHTE

Areas of Expertise: Water supply and wastewater management, Greywater/recycled water and alternative supply sources, Irrigation, Groundwater

Research Interest: Urban/rural water conservation and reuse, Alternative water supplies, Wastewater management, Water and sanitation in developing countries, Emergency situations.

Current Projects: Rainwater harvesting investigations for companies in Melb's western suburbs, Urban irrigation efficiency improvements through smart control systems, Technical feasibility investigations for using stormwater as an alternative supply source in urban areas, Wastewater treatment and nutrient removal using grass filtration, Evaluation of potential for greywater reuse.

Industries: Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



ASSOCIATE PROFESSOR JUN-DE LI

Areas of Expertise: Fluid dynamics

Research Interest: Desalination, Renewable energy, Heat and mass transfer, Fluid dynamics, Turbulence

Current Projects: Water conservation by replacing cooling towers, Humidification and dehumidification desalination, Membrane distillation desalination, Biofuels from algae, Heat transfer and condensation of water vapour from humid air in compact heat exchangers, Membrane distillation desalination.

Industries: Energy and Utilities, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Alternative Energy



DR QING-QUAN LIANG

Areas of Expertise: Structural Engineering, Structural Analysis, Steel- Concrete Composite Structures

Research Interest: Computational mechanics, Structural optimization topology, shape and sizing optimization, Steel-concrete composite structures, Nonlinear inelastic analysis of structures, Concrete structures, Steel structures

Current Projects: Nonlinear inelastic analysis of concrete-filled steel tubular slender beam-columns with local buckling effects, Nonlinear inelastic analysis of steel-concrete composite columns at elevated temperatures, Nonlinear time-dependent analysis of slender steel-concrete composite beam-columns, Advanced analysis of steel-concrete composite frames under extreme loading, Finite element analysis of composite beams under combined bending and shear, Multi-objective optimization of nonlinear steel frames under seismic loads, Performance-based optimization of structures: theory and applications.

Industries: Building, Construction and Architecture

Research Strength: Education, access and transition



DR SANDRA MCKECHNIE

Areas of Expertise: Mammalian Cell Culture, Microbiology, Immunology

Research Interest: Cancer Biology, Therapeutic benefits of Probiotics, Allergies and Immune System Modulation, Bioactivity of Flavonols.

Current Projects: Bioactive Bok Choy – assessing the antiproliferative activity of Bok Choy flavonols against colon carcinoma cell lines.

Industries: Food and Dairy, Molecular Sciences, Science

Research Strength: Diversity and wellbeing

Faculty Research Group: Advanced Food Systems



DR ALASDAIR MCANDREW

Areas of Expertise: Digital Image Processing, Mathematics, Mathematics education, Computational Methods, Computer Algebra, Computer and Internet Security, Computer Science Education

Research Interest: Mathematics, Mathematics Education, Cryptography, Computer Security, Digital Image Processing, Computer Algebra.

Current Projects: Using the access grid for enhancing student learning, Embedding mathematical software in undergraduate mathematics, Improving learning outcomes for students in first year mathematics subjects, Professional Learning Program for teachers of VCE mathematics.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Education, access and transition

Faculty Research Group: Applied Mathematics



PROFESSOR YUAN MIAO

Areas of Expertise: Software Engineering, Artificial Intelligence, Fuzzy Systems, Information Systems, eHealth Systems, Educational Games

Research Interest: Fuzzy Cognitive Modelling, Knowledge Oriented Software Engineering, GUI Test Automation, Edutainment, eHealth.

Current Projects: Data exchange and service integration with applications in Health Information Systems, ARC linkage, Data integration, Enhancement and mining for collaborative adaptive health management, VU research infrastructure grant, Agent-augmented co-space: growing cognitive autonomous agents for context-aware personalized experience in co-space, NRF Singapore, Collaborative mathematics game for number learning through tablets, Microsoft research Asia.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



ASSOCIATE PROFESSOR IWONA MILISZEWSKA

Areas of Expertise: Database systems, Transnational education, Effective teaching methods, Women in ICT, Learning in the workplace, Technology based learning

Research Interest: Transnational education, Internationalisation in education, Technology supported teaching and learning, Evaluation of teaching, Females in ICT.

Current Projects: Science Safety Game: the development and implementation of a computer game for providing OHS training for science students, An Australian Malaysian nexus on transnational education, Investigation of strategies aimed at encouraging girls from economically and socially disadvantaged backgrounds to consider a career in information and communication technology (ICT), Refinement of a multidimensional model for transnational computing education programs, Engendering equity: fostering Computer Science success among female students.

Industries: Information and Communication Technology (ICT)

Research Strength: Education, access and transition



DR SHOBHA MUTHUKUMARAN

Areas of Expertise: Membrane Technology, Water and Wastewater Treatment, Applied Ultrasonics

Research Interest: Membrane Technology, Desalination, Intergraded water Management, Alternative Water Supplies, Applied Ultrasonics, Biofuel Production.

Current Projects: Decision Support System for Yarra River Water Management, Water End-use Demand Management, Low Pressure Membranes for the Reclamation and Reuse of Treated Effluent.

Industries: Energy and Utilities, Food and Dairy, Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Alternative Energy, Water Resources



ASSOCIATE PROFESSOR MARY MILLIKAN

Areas of Expertise: Water quality analyses, Applied Analytical Chemistry

Research Interest: Studies on Chinese medicinal herbs for specific health problems, Water quality analyses, Wine analyses, Composition of range cereals, Analyses of various meat products, NIR analyses of food and agricultural products.

Current Projects: Analyses of pesticides residues on fruit, Water contaminant analyses, Chinese herbal studies, Meat product analyses.

Industries: Agriculture and Farming, Chinese Medicine, Food and Dairy, Science, Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Alternative Energy, Engineered Packaging and Distribution



DR NITIN MUTTIL

Areas of Expertise: Rainfall-runoff modelling – hydrologic and hydraulic modelling using conceptual models, Model calibration using evolutionary algorithms, Forecasting hydrologic and other water resources variables.

Research Interest: Urban rainfall-runoff modelling, Hydrologic predictions using data-driven techniques, Climate variability and climate change impacts on water resources, Data mining of hydrologic and water quality data.

Current Projects: Impact of high strength wastewater on sewer networks, Statistical analysis to detect climate change and its implications on water resources, Development of a water sustainability index for use in integrated water management.

Industries: Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



MR VALLI NAVARATNAM

Areas of Expertise: Computer Programming, Electrical Machines and Power Systems

Research Interest: Engineering Education, Problem Based Learning.

Current Projects: Role of industry and community in Engineering education.

Industries: Electrical and Electronics, Science

Research Strength: Education, access and transition

Faculty Research Group: Smart Energy



DR LAWRENCE NGEH

Areas of Expertise: Remediation of contaminated land and wildlife using magnetic particles, Analyses of pesticides and trace metals in soil, water, food and herbs.

Research Interest: The development of magnetic particle technology for application to environmental remediation, Analyses of pesticides and trace metals in soil, water, food and herbs.

Current Projects: The rational development of improved pre-conditioning agents for the removal of oil contamination from wildlife and rocky foreshore. The Elemental Analysis of Traditional Chinese Herbs in Relation to Specific Disease States

Industries: Chemistry, Chinese Medicine, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Advanced Food Systems



DR ANNE NG

Areas of Expertise: River water quality modelling, Parameter optimisation and uncertainty analysis, Infrastructure asset management

Research Interest: River water quality modelling, Integrated water resources management

Current Projects: Nonpoint source modelling in Yarra River, Effective management of septic tank pollution in the Yarra River - A framework to model external end use

Industries: Agriculture and Farming, Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



DR THINH NGUYEN

Areas of Expertise: Optical fibre sensors, Optical characterisation, Rare earth spectroscopy LabVIEW programming

Research Interest: Sensors Optics and photonics, Environmental and health monitoring Solar technology

Current Projects: Development of a miniature blood gas analyser using optical-based methods as well as gas sensors for water/environmental monitoring using fibre optics and photoacoustics, engineering education.

Industries: Education, Electrical and Electronics, Mining, Oil and Gas, Photonic and Optoelectronic, Project Management, Science, Sustainability and Environment

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



PROFESSOR JOHN ORBELL

Areas of Expertise: Biological and Environmental Chemistry

Research Interest: Water management, Environmental management and technology, Wildlife rehabilitation, Traditional medicines, computational chemistry, Analytical chemistry

Current Projects: Water management in large industries, Control of biofouling in water pipeline systems, The application of magnetic particle technology to wildlife rehabilitation and environmental remediation, Chemistry of traditional medicines, The chemistry of membrane fouling, Computational chemistry of antioxidants

Industries: Science

Research Strength: Sustainable environmental technologies

Faculty Research Group: Advanced Food Systems



DR ROHANI PAIMIN

Areas of Expertise: Solvent Extraction, Membrane Extraction, Supercritical Fluid Extraction, Analytical Chemistry, Alternative medicine

Research Interest: Solvent Extraction, Membrane Extraction, Supercritical Fluid Extraction, Techniques involved include High Performance Liquid Chromatography, Gas Chromatography, GC-MS, Spectroscopy methods including Mass Spectroscopy, Atomic Absorption Spectrophotometry, I.R. Spectroscopy, FTIR Spectroscopy, Alternative Medicine.

Current Projects: An Investigation into the migration of phthalates in food packaging.

Industries: Building, Construction and Architecture

Research Strength: Sustainable environmental technologies



DR CAGIL OZANSOY

Areas of Expertise: Power Systems Communications

Research Interest: Microgrids, Renewable energy systems, Sustainable buildings, Energy storage, Distributed generation, Energy efficiency.

Current Projects: Modelling and development of microbial electrolysis and fuels cells, Hardware Analysis of Fuel Cell/Photovoltaic Systems, Analysis of Wind Power Potential in Melbourne's West, Photovoltaic Power Analysis for Brimbank Victoria, Australia.

Industries: Electrical and Electronics, Energy and Utilities, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Alternative Energy, Smart Energy



DR ANTHONY PARKER

Areas of Expertise: Mechanical Engineering, Design and testing of protective packaging, Dynamics and vibration, Simulation of transportation environment, Digital signal processing

Research Interest: Environmental shock and vibrations, Distribution packaging, Transport and vehicle dynamics, Experimental design

Current Projects: A Nonlinear Structural Integrity Assessment Technique, Nonlinear vibration analysis, A novel GSM/GPS location system

Industries: Building, Construction and Architecture

Research Strength: Logistics and transportation, Strategic economics, Sustainable environmental technologies

Faculty Research Group: Engineered Packaging and Distribution



PROFESSOR CHRIS PERERA

Areas of Expertise: Hydrology and Water Resources

Research Interest: Optimum operation of water systems, Climate change impacts on water systems, Water conservation and demand management, Urban water cycle management, River water quality management, Water infrastructure asset management.

Current Projects: Multi-objective planning and operation of water systems, Urban water demand estimation and water use, Impact of climate change on streamflow and water yield, Water infrastructure deterioration models, Use of stormwater as an alternative supply source, River and catchment water pollution.

Industries: Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



DR RANDALL ROBINSON

Areas of Expertise: Plant recruitment, Clonality in plants, Introduced plants, Orchids, Environmental Management.

Research Interest: Recruitment in plants, clonality and genetics in plants, introduced plant species, ecosystem management, dynamics of grassland / woodland and wetland ecosystems, Heritability in the genus *Cymbidium*

Current Projects: Recruitment dynamics of *Melaleuca ericifolia*, Hypocotyl hairs in *Melaleuca ericifolia*, Population structure and dynamics in *Melaleuca* wetlands, Recruitment of Grassland Forbs, Colour inheritance in the genus *Cymbidium*-Hybridisation and invertebrate host capabilities of introduced plant species.

Industries: Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Ecology



DR GITESH RAIKUNDALIA

Areas of Expertise: Information and Communication Technology

Research Interest: Health Informatics, Groupware (real-time and asynchronous collaboration), Software Engineering

Current Projects: Web-based osteo-arthritis guide, Multi-disciplinary team meetings for cancer care, Hospital simulation, Data warehousing in health care organisations, Microblogging in a virtual organisation.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



DR JOSEF ROJTER

Areas of Expertise: Epistemological framework of professional engineering practices, The role of ethics in professional engineering discourse, Material substitution with sustainable relevance, Clean Manufacturing technologies, Polymer processing, Fuel technology

Research Interest: Universities as learning institutions, Embodied energy in materials, Recycling of glass.

Current Projects: Recycling of glass, Universities as learning institutions, Impact of engineering research at universities on engineering discourses in workplaces.

Industries: Manufacturing and Industrial, Transport and Logistics

Research Strength: Logistics and transportation, Sustainable environmental technologies



ASSOCIATE PROFESSOR VINCENT ROUILLARD

Areas of Expertise: Dynamics, shock and vibration, Signal measurement and analysis, Engineering Experimentation

Research Interest: Stochastic processes, Environmental shock and vibrations, Distribution packaging, Transport and vehicle dynamics, Experimental design.

Current Projects: Investigation of the creep characteristics of aluminium alloy conductors at elevated temperatures, Developments of methods for synthesizing non-Gaussian random vibrations, Study into the estimation of road vehicle frequency response characteristics from vibration response data, Development of technique for monitoring the rate of damage of packaging elements subject to random loads, Development of statistical models to characterize stochastic vehicle vibrations, Study in the behaviour of non-linear cushioning material.

Industries: Automotive and Aeronautical, Building, Construction and Architecture, Energy and Utilities, Manufacturing and Industrial, Mining, Oil and Gas, Transport and Logistics

Research Strength: Sustainable environmental technologies

Faculty Research Group: Engineered Packaging and Distribution



DR CAROL SCARPACI

Areas of Expertise: Animal Behaviour (marine mammals and sharks) with respect to the management of tourism, Bioacoustics and Development of Sustainable Industry practices.

Research Interest: Marine cetacean, megafauna, pinnaped and penguin tourism and management. Shellfish fishery management.

Current Projects: Behavioural responses (short and long term) of marine mammals to tourism. Development and implementation of effective guidelines (code of conduct or regulatory) to protect targeted species and promote sustainable tourism.

Industries: Science, Sustainability and Environment

Research Strength: Sustainable environmental technologies, Tourism

Faculty Research Group: Applied Ecology



DR JAKUB SAJMAN

Areas of Expertise: Measurement of stress in thin films, Surface science, Fibre optic sensors

Research Interest: Measurement of stress in thin films, Surface science, Fibre optic sensors

Current Projects: Recruitment dynamics of *Melaleuca ericifolia*, Hypocotyl hairs in *Melaleuca ericifolia*, Population structure and dynamics in *Melaleuca* wetlands, Recruitment of Grassland Forbs, Colour inheritance in the genus *Cymbidium*-Hybridisation and invertebrate host capabilities of introduced plant species.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Mathematics



DR MARK SCARR

Areas of Expertise: Ecology, Ecophysiology

Research Interest: Using stomatal frequency as a proxy indicator of atmospheric CO2 concentration, Examining leaf physiognomic responses to environmental factors, Mangrove incursion in saltmarsh habitat.

Current Projects: The use of stomatal frequency from three Australian temperate broadleaf evergreen tree species as a proxy indicator of atmospheric carbon dioxide concentration, Mangrove encroachment of saltmarsh in Corner Inlet, Victoria: the role of soil salinity, soil water and sea-level rise.

Industries: Science, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Applied Ecology



ASSOCIATE PROFESSOR MICHAEL SEK

Areas of Expertise: Mechanical Engineering, Digital signal analysis and data acquisition, Modelling of nonlinear dynamics, Nonstationary vibration, Simulation of transportation environment, Protective packaging for transportation, Engine testing.

Research Interest: Analysis of random signals, Engineering optimization of sustainable protective packaging for transportation, Road-vehicle-cargo-interaction, Protection against environmental shocks and vibration – cushioning

Current Projects: Nonlinear and nonstationary behaviour of packaging systems during transportation, Dynamic properties and characterisation of materials used for cushioning, Characterisation of road roughness and profilometry, Frequency dependent characteristics of vehicle dynamics.

Industries: Automotive and Aeronautical, Manufacturing and Industrial, Sustainability and Environment, Transport and Logistics

Research Strength: Logistics and transportation, Sustainable environmental technologies

Faculty Research Group: Engineered Packaging and Distribution



ASSOCIATE PROFESSOR HAO SHI

Areas of Expertise: p2p Network, Location-based services, Web services, Computer/robotics vision, Visual Communications, Internet and multimedia technologies.

Research Interest: Location-based services, e-Health applications, Peer to Peer network, Wireless technologies, Visual Communications, Computer/robotics vision.

Current Projects: Health data management and visualization techniques for health, Decision making support, An innovative smartphone based Wi-Fi application, Peer-to-Peer collaborative research network for sharing and managing digital legal information, Intelligent Object Framework, Computerized performance analysis for ball games, Mobile health data management and data integration.

Industries: Electrical and Electronics, Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



ASSOCIATE PROFESSOR NALIN SHARDA

Areas of Expertise: Information and Communication Technology (ICT), Human Computer Interaction, Mobile Multimedia, eLearning, eTourism

Research Interest: Digital Ecosystems, User Experience Design, Networked Multimedia Systems, Applied Informatics including e-Learning, e-Tourism, e-Water.

Current Projects: Investigations of techniques for maximising the utilisation of harvested rain water using a digital ecosystem, Digital ecosystem for harvested rainwater, Ontology and application generator for tourism systems, Demonstrating potential of travel recommender systems, Leading edge developments in tourism ICT technologies.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied Informatics



DR JUAN SHI

Areas of Expertise: Automatic Control and Applications

Research Interest: Intelligent control, Control applications, Power system stabilization, Smart energy systems, System identification, Engineering education.

Current Projects: Dynamic Output Feedback Sliding Mode Control for Magnetic Bearing System Stabilization, Fuzzy Logic Control of a Magnetic Bearing System, Development of Renewable Energy System v Smart Energy Systems v Power System Stabilization with FACTS, Engaging Engineering Students with PBL (Problem Based Learning) Problems From Industry and Community

Industries: Electrical and Electronics

Research Strength: Sustainable environmental technologies

Faculty Research Group: Smart Energy



PROFESSOR PENG SHI

Research Interest: Control theory and applications, Intelligent systems and information processing, Fault detection techniques, Operational research, Signal and image processing.

Current Projects: Modelling, control design and stability analysis of networked nonlinear control systems with random communication delay, Analysis and Synthesis for Complex Dynamical Markovian Jump Systems with Uncertain Transition Probability, State Filtering and Parameter Identification for Nonlinear Polynomial Systems, based on Optimal H-2 and H-infinity algorithms.

Industries: Electrical and Electronics, Science, Telecommunications

Research Strength: Communication and sensor technologies, Logistics and transportation, Sustainable environmental technologies

Faculty Research Group: Smart Energy, Applied Mathematics



DR GRACE TAN

Areas of Expertise:

Research Interest: Object Oriented Technology, Internet/Distributed Programming, Web Usability, Network Information Technology, Intelligent Agents, Sociotechnical and equity issues in Computer Science

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



ASSOCIATE PROFESSOR ANDREW SMALLRIDGE

Areas of Expertise:

Research Interest: Biosynthesis of pharmaceutical precursors, Nuclear Magnetic Resonance Spectroscopy, Synthetic Organic Chemistry, Supercritical Fluids.

Current Projects: Biocatalytic preparation of Ephedrine in Supercritical Carbon Dioxide

Industries: Biotechnology, Chemistry (physical, polymer, analytical), Health, Manufacturing and Industrial, Molecular Sciences, Nursing, Science.

Research Strength: Sustainable environmental technologies, Diversity and wellbeing.



DR DUNG TRAN

Areas of Expertise: Data mining

Research Interest: Forecasting models for water systems, Decision support models for water infrastructure asset management, Application of in-situ sensors for monitoring deterioration of water pipelines, Data mining using statistical and artificial intelligence methods.

Current Projects: Rainfall and streamflow forecasting, Investigation of sewer and manhole deterioration, Water quality monitoring of urban wetland using stormwater.

Industries: Water

Research Strength: Sustainable environmental technologies

Faculty Research Group: Water Resources



DR SRIKANTH VENKATESAN

Areas of Expertise: Earthquake resistant design of structures and ground motion modelling, Bridge infrastructure asset management, Design of industrial buildings, metallurgical plant structures

Research Interest: Earthquake Engineering, Bridge Asset Management, Smart structures and materials Problem Based Learning

Current Projects: Seismic Hazard modelling in regions of low to moderate seismicity, Structural damage detection in timber bridges using response signals, Non-destructive assessment of timber bridge characteristics, Assessing individual contribution in team based pedagogies.

Industries: Building, Construction and Architecture, Sustainability and Environment

Research Strength: Education, access and transition, Sustainable environmental technologies

Faculty Research Group: Structural Mechanics and Materials



ASSOCIATE PROFESSOR XUN YI

Areas of Expertise: Cyberspace security

Research Interest: Cyberspace security; Mobile and wireless communication security; Privacy-preserving data mining; Software agent; Electronic commerce

Current Projects: Privacy-preserving distributed data mining; Privacy protection for distributed data mining; Private data warehouse query

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



DR THOMAS YEAGER

Areas of Expertise: Mammalian tissue culture, Cancer research, Fermentation development

Research Interest: Molecular biology of cancer, Fermentation process, Membrane fouling

Current Projects: Evaluation of non-chemical pulsed-power technology as an anti-fouling treatment for reverse osmosis desalination, Development of biological models to assess the therapeutic potential of bioactive compounds

Industries: Biotechnology, Molecular Sciences, Science, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Biomedical and Lifestyle Diseases, Advanced Food Systems



DR ABDULLAH YILMAZ

Areas of Expertise: Climate change hydrology, hydrological modelling, integrated water resources management

Research Interest: Climate change, Hydrologic modelling, Integrated water resources management, Artificial intelligence applications in hydrology

Current Projects: Hydro-meteorological trend analysis in Gediz Basin

Industries: Building, Construction and Architecture, Sustainability and Environment, Water

Research Strength: Sustainable environmental technologies



ASSOCIATE PROFESSOR ALADIN ZAYEGH

Areas of Expertise: Electronics, Microelectronics, Biomedical Electronics, Instrumentation

Research Interest: Biomedical Electronics, Biomedical Sensors, Wireless Sensors, Microelectronic System design, Smart and renewable Energy

Current Projects: MEMS Biomedical Pressure Sensor for gait analysis, Reconfigurable analog-to-digital converter for Ultra Wideband Radio, A reconfigurable bio-signal processor for blood gas analysis, An adaptive low-power analog-to-digital converter for Smart Sensors.

Industries: Electrical and Electronics

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors, Smart Energy

RESEARCH EXPERTISE STAFF PROFILES

**SCHOOL OF
NURSING AND
MIDWIFERY**



ASSOCIATE PROFESSOR MARY CAROLAN

Areas of Expertise: Qualitative Methodology, Thematic Analysis, Midwifery cultural diversity.

Research Interest: Older maternity, Gestational diabetes among culturally diverse groups, Ultrasound technology and high risk pregnancy, Immigrant women.

Current Projects: Perinatal morbidity among Australian women aged 35 years and older, Gestational diabetes among multi-cultural groups in the Western Region of Melbourne, The Australian pregnancy experiences of African women, Anxious waiting: soft markers and high risk pregnancy, Midwifery students' understanding the role of the midwife: how does student understanding impact on course attrition rates?

Industries: Education, Health, Midwifery

Research Strength: Diversity and wellbeing, Education, access and transition

Faculty Research Group: Clinical and Community Health



DR DEB KERR

Areas of Expertise: Research ethics, Intranasal medication delivery, Coronary care nursing, Clinical research.

Research Interest: Transforming nursing care at the bedside, Bedside nursing handover, Intranasal medication delivery, Medication administration by registered nurses.

Current Projects: Patient controlled intranasal fentanyl for women during childbirth, Bedside nursing handover, Medication administration by registered nurses, Gripsox for preventing falls in the elderly during hospitalisation, Exercise for women after breast cancer treatment.

Industries: Health, Nursing

Research Strength: Diversity and wellbeing

Faculty Research Group: Clinical and Community Health



DR MAUREEN FARRELL

Areas of Expertise: Medical surgical nursing, Acute care nursing, Health informatics, Mobile technologies, Nursing education, Health management and leadership.

Research Interest: Health informatics, Mobile hand held computers, Medical surgical nursing, Nursing education and leadership.

Current Projects: Improving patient health outcomes in acute care hospital settings using mobile wireless technology and handheld computers.

Industries: Health, Information and Communication Technology (ICT), Nursing Research Strength: Applied informatics, Education, access and transition

Faculty Research Group: Clinical and Community Health



ASSOCIATE PROFESSOR LIZA HESLOP

Areas of Expertise: Medical surgical nursing, acute care nursing, health informatics, mobile technologies, nursing education, health management and leadership

Research Interest: Health informatics, mobile hand held computers, medical surgical nursing, nursing education and leadership.

Current Projects: Australian Research Council Linkage Grant PI Improving patient health outcomes in acute care hospital settings using mobile wireless technology and handheld computers, Industry Partners Royal Women's Hospital and Austin Health

Industries: Health, Information and Communication Technology (ICT), Nursing

Research Strength: Applied informatics, Education, access and transition

Faculty Research Group: Clinical and Community Health



DR LUCY LU

Areas of Expertise: Pharmacology, Quantitative research methodologies, Applied statistics in health research.

Research Interest: Medication management, Quality of working life in nursing, Health complications/medical co-morbidity, Quantitative research methodologies, Applied statistics in health research.

Current Projects: Nursing handover at Western Health, The evaluation of the impact of shift-to-shift bed-side nursing handover on quality of nursing care, Evaluation of a medication endorsement program for division two registered nurses.

Industries: Health, Nursing

Research Strength: Diversity and wellbeing

Faculty Research Group: Clinical and Community Health



PROFESSOR TERENCE MCCANN

Areas of Expertise: Mental health nursing, Mixed methods (qualitative and quantitative) research

Research Interest: Prevention and early intervention in youth with mental health problems, Mental health literacy and help-seeking, Primary caregiver interventions, Improving the quality of care

Current Projects: Mental health literacy of main support people of elderly family members/friends with mental illness, Evaluating the use of restraint and seclusion in inpatient aged psychiatry units, Preventing mental health problems in young people through better mental health literacy, Problem solving based self-help manual for primary caregivers of family members with first-episode psychosis, Exploring needs — examining barriers to service access: young people with depression, anxiety and substance use issues.

Industries: Health, Nursing

Research Strength: Diversity and wellbeing

Faculty Research Group: Clinical and Community Health



PROFESSOR KRISTINE MARTIN-MCDONALD

Areas of Expertise: Chronic Illness

Research Interest: Chronic disease, Renal replacement therapies, Qualitative research, Narrative inquiry, Rural health.

Current Projects: Interprofessional education and practice.

Industries: Health, Midwifery, Nursing

Research Strength: Diversity and wellbeing

RESEARCH EXPERTISE STAFF PROFILES

**CENTRE OF APPLIED
INFORMATICS**



ASSOCIATE PROFESSOR REZAUL BEGG

Areas of Expertise: Ageing gait, Bio-signal processing, Biomedical engineering, Gait biomechanics, Movement analysis, Sensor technologies in healthcare

Research Interest: Biomedical Engineering, Biosignal Processing, Gait and Movement Analysis, Computational Intelligence and Pattern Recognition, Sensor Technologies for Healthcare, Biomedical Instrumentation, Foot Pressure Sensors, Sensor Design.

Current Projects: Building a smart diagnostic system for low back ailments, Development of an end functional capsule for targeted delivery of biomarkers in the alimentary tract, High speed, three dimensional, x ray fluoroscopy for accurate measurement of human joint motion, Non-invasive assessment of hip fracture risk in elderly people, Development of a portable sensor for measuring physical activity in the lower limb, Development of a new system to measure pedalling technique in real-world conditions, Gait, trips, slips and falls.

Industries: Science

Research Strength: Applied informatics, Sport performance, exercise science and active living



PROFESSOR YUAN MIAO

Areas of Expertise: Software Engineering, Artificial Intelligence, Fuzzy Systems, Information Systems, eHealth Systems, Educational Games

Research Interest: Fuzzy Cognitive Modelling, Knowledge Oriented Software Engineering, GUI Test Automation, Edutainment, eHealth.

Current Projects: Data exchange and service integration with applications in Health Information Systems, Enhancement and mining for collaborative adaptive health management, Growing cognitive autonomous agents for context-aware personalized experience in co-space, Mathematics game for number learning through tablets

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



ASSOCIATE PROFESSOR NALIN SHARDA

Areas of Expertise: Information and Communication Technology (ICT), Human Computer Interaction, Mobile Multimedia, eLearning, eTourism

Research Interest: Digital Ecosystems, User Experience Design, Networked Multimedia Systems, Applied Informatics including e-Learning, e-Tourism, e-Water.

Current Projects: Investigations of techniques for maximising the utilisation of harvested rain water using a digital ecosystem, Digital ecosystem for harvested rainwater, Ontology and application generator for tourism systems, Demonstrating potential of travel recommender systems, Leading edge developments in tourism ICT technologies.

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics



DR GUANDONG XU

Areas of Expertise: Data Mining, Web Technology, Social Computing

Research Interest: Data Mining, Machine learning, Web Data Management, Web Information Retrieval, Health Informatics

Current Projects: Social Surveillance: a Social Media Mining Approach for Public Event Detection, Data Integration, Data Mining, and Knowledge Utilization and Dissemination for Smarter and Collaborative Data Management in Health

Industries: Information and Communication Technology (ICT)

Research Strength: Applied informatics



PROFESSOR YANCHUN ZHANG

Areas of Expertise: Database, Internet and Web information systems, Service-oriented computing, Health Informatics, e-Research

Research Interest: Data management, Data mining, Web mining, Web services, Health informatics, Social computing.

Current Projects: Privacy protection in distributed data mining, A framework for supporting consistent and reliable collaborative business transactions, Data enhancement, integration and access services for smarter, collaborative and adaptive whole of water cycle management, Data exchange and health service integration in health information systems, Real-time and self-adaptive stream data analyser for Intensive Care management.

Industries: Information and Communication Technology (ICT), Science
Research Strength: Applied informatics



ASSOCIATE PROFESSOR XUN YI

Areas of Expertise: Cyberspace security

Research Interest: Cyberspace security; Mobile and wireless communication security; Privacy-preserving data mining; Software agent; Electronic commerce

Current Projects: Privacy-preserving distributed data mining; Privacy protection for distributed data mining; Private data warehouse query

Industries: Information and Communication Technology (ICT), Science

Research Strength: Applied informatics

RESEARCH EXPERTISE STAFF PROFILES

**CENTRE FOR
ENVIRONMENTAL
SAFETY AND RISK
ENGINEERING**



DR MICHELLE BALL

Areas of Expertise: Science

Research Interest: Sleep, Neuropsychology, Arousal thresholds to alarm signals across ages, after substance intake and for the hearing impaired, Pitch of emergency notification signals, Fire fatalities and human behaviour, Human factors in fire equipment, Juvenile fire-lighters.

Current Projects: Mental illness as a risk factor for death in fire, Improving the identification of juvenile fire setters at high risk of recidivism, Investigation of risk factors in serious residential fires, Development of Fire Fatality Coronal Database, Arousal thresholds for people under the influence of hypnotics – implications for the smoke alarm signal.

Industries: Sustainability and Environment

Research Strength: Sustainable environmental technologies



DR MAURICE GUERRIERI

Area of Expertise: Performance of concrete in fire.

Research Interest: Structural Fire Engineering, performance of concrete in fire, numerical and hybrid technological modelling, Performance of concrete in fire, structural fire engineering of buildings, Use of hybrid technology to model real life structures under fire loads.

Current Projects: Measurement and Influence of Insitu Pore Pressures and Temperatures on Spalling of Slender Reinforced Concrete Walls Subjected to fire and the Influence of Polypropylene Fibres on combating Spalling

Industries: Health

Research Strength: Sustainable environmental technologies

Faculty Research Group: Structural Mechanics and Materials



PROFESSOR DOROTHY BRUCK

Areas of Expertise: Human behaviour in fire, Insomnia, Narcolepsy, Sleep, Sleep disorders, Smoke alarms

Research Interest: Sleep, Arousal thresholds across ages, after substance intake and for the hearing impaired, Emergency notification such as smoke alarms, Fire fatalities and human behaviour, Human factors in fire equipment, Juvenile fire-lighters.

Current Projects: Improving the identification of juvenile fire setters at high risk of recidivism, Investigation of survival factors in serious residential fires, The role of location on the effectiveness of smoke alarms, Development of Fire Fatality Coronal Database, Arousal thresholds for people under the influence of hypnotics – implications for the smoke alarm signal.

Industries: Sustainability and Environment

Research Strength: Sustainable environmental technologies



DR KHALID MOINUDDIN

Areas of Expertise: Fire dynamics

Research Interest: Enclosure fire dynamics, Computational fluid dynamics, Turbulent flow, Fire risk analysis – Structure in fire, Optimization technique

Current Projects: Experimental and numerical investigation of turbulence driven secondary motion on a stream wise external corner, Fire development in enclosures, Fire dynamics modelling and use of optimization techniques, Estimates of the reliability of fire safety system components, Efficacy of the sprinkler system in office buildings, Evaluation of the impact of potential fire scenarios on structural elements of a cable-stayed bridge.

Industries: Agriculture and Farming, Building, Construction and Architecture, Sustainability and Environment

Research Strength: Sustainable environmental technologies



PROFESSOR DAVID PROE

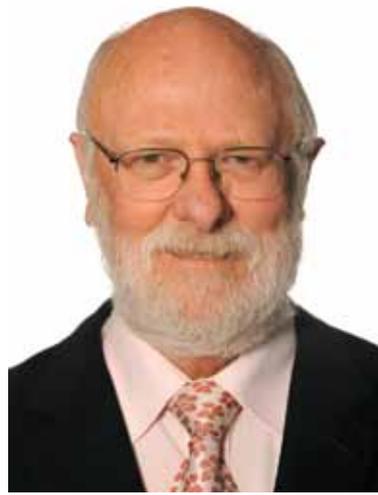
Areas of Expertise: Fire safety, Structural behaviour under fire conditions, Building regulations

Research Interest: Fire safety in buildings, Performance-based assessment methods for building fire safety, Structural behaviour under fire conditions, Finite element analysis, Heat transfer, Risk assessment, Modelling the spread of smoke in buildings, Analysis of the evacuation of buildings

Current Projects: Improve the building regulations that relate to fire protection in commercial buildings, Information to fire engineers who need to access and design for the safety of buildings.

Industries: Sustainability and Environment

Research Strength: Sustainable environmental technologies



PROFESSOR GRAHAM THORPE

Areas of Expertise: Sustainable architecture Postharvest technology of fresh and durable produce

Research Interest: Improving the design and operation of buildings by developing and employing advanced computer-aided design tools, Mitigating the effects of climate change on the built environment, Designing buildings to be fire-safe.

Current Projects: The integration, or syncretisation, of engineering and architecture in the building-design process and its likely impact on the education of architectural professionals, An analogous omniscient approach to postharvest technology is being developed which integrates multi-physics with a range of chemical and biological sciences. This approach will be extended to the design of sustainable buildings.

Industries: Agriculture and Farming, Building, Construction and Architecture, Sustainability and Environment

Research Strength: Sustainable environmental technologies

Faculty Research Group: Engineered Packaging and Distribution



PROFESSOR IAN THOMAS

Research Interest: Fire safety, fire engineering, risk management and analysis, human behaviour in fire, behaviour of fire in enclosures, fire dynamics, smoke alarms-activation, sounds and occupant response, building regulations, structural response in fire, structural engineering, fire sprinkler systems, bushfire bunkers.

Current Projects: The role of the location on the effectiveness of smoke alarms, Realising community benefits from improved building regulations, Fire risk analysis of commercial buildings, Waking effectiveness of alarms (auditory, visual and tactile) for the alcohol impaired, Waking effectiveness of alarms (auditory, visual and tactile) for the older adults.

Industries: Sustainability and Environment

Research Strength: Sustainable environmental technologies

RESEARCH EXPERTISE STAFF PROFILES

**CENTRE FOR
TELECOMMUNICATIONS
AND MICROELECTRONICS**



PROFESSOR STEPHEN COLLINS

Areas of Expertise: Physics, Optical fibre technology, Instrumentation, Electronics
Research Interest: Optical fibre sensors, especially strain and temperature sensors, optical fibre Bragg gratings, optical materials including rare-earthdoped optical fibres for optical amplifiers and lasers, Optoelectronic imaging
Current Projects: Fibre Bragg grating microstructures: A novel sensing tool? Improved fibre Bragg grating sensors for detection of structural hot spots, Thulium doped silica-based optical fibre amplifiers
Industries: Electrical and Electronics, Photonic and Optoelectronic, Science
Research Strength: Communication and sensor technologies
Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



DR HORACE KING

Areas of Expertise: Electronics, Remote Sensing and GIS, Telecommunications
Research Interest: Emerging Digital Telecommunication Technologies, Strategic Telecommunications Network Planning, Biomedical Engineering, Network Design, Management and Optimisation
Current Projects: Design of Low Power Digital Transmitters, Opportunistic Spectrum Access in Cognitive Radio Networks, Improved Cellular Networks through Cooperative coordination, Coexistence and spectrum sharing of LTE and DVBT, Digital Habitat Echo system Communication Architecture, 21st Century Wireless System Interoperability
Industries: Electrical and Electronics, Information and Communication Technology (ICT), Remote Sensing and GIS, Telecommunications
Research Strength: Communication and sensor technologies
Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



PROFESSOR MICHAEL FAULKNER

Areas of Expertise: Wireless Communications, Telecommunication Transmission Systems, Radio frequency propagation, Antennas, Signal processing
Research Interest: Multiuser Wireless Communications
Current Projects: Software Defined Radio, Cognitive Radio, Green Base Station Architectures
Industries: Telecommunications
Research Strength: Communication and sensor technologies
Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



DR DANIEL LAI

Areas of Expertise: Computational Modelling, Wireless Sensor Networks, Biomedical and Sports Technology
Research Interest: Body Sensor Networks, Intrabody Communications, Nanosensor Networks
Current Projects: Sensors and Actuators for Movement, Wireless Sensor Networks for Health, Human Body Channel Modelling for Intrabody Communications
Industries: Electrical and Electronics, Health Information and Communication Technology (ICT), Telecommunications
Research Strength: Communication and sensor technologies, Sport performance, exercise science and active living
Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



DR FOTIOS SIDIROGLOU

Areas of Expertise: Rare-earth doped optical fibres, Fibre Bragg Gratings (FBGs), Environmental monitoring and sensing using optical fibre based sensors, High spatial resolution imaging, Post-processing of optical fibres using mechanical polishing and chemical etching techniques.

Research Interest: Photonics and optical communications, Rare-earth doped optical fibre lasers and amplifiers, Fibre Bragg Gratings, Environmental sensing with the aid of FBGs and other fibre optic devices – micro characterisation of optical fibres and waveguides and other optical materials using a range of imaging techniques, Tuneable optical devices.

Current Projects: Elemental analysis of RE-doped optical fibres, A novel approach for fabricating rare-earth doped optical fibres, Development of fibre optic based sensors for application in environmental monitoring, CO₂ detection in water with the aid of the photo acoustic effect.

Industries: Telecommunications

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors



ASSOCIATE PROFESSOR ALADIN ZAYEGH

Areas of Expertise: Electronics, Microelectronics, Biomedical Electronics, Instrumentation

Research Interest: Biomedical Electronics, Biomedical Sensors, Wireless Sensors, Microelectronic System design, Smart and renewable Energy

Current Projects: MEMS Biomedical Pressure Sensor for gait analysis, Reconfigurable analog-to-digital converter for Ultra Wideband Radio, A reconfigurable bio-signal processor for blood gas analysis, An adaptive low-power analog-to-digital converter for Smart Sensors.

Industries: Electrical and Electronics

Research Strength: Communication and sensor technologies

Faculty Research Group: Telecommunications, Electronics Photonics and Sensors, Smart Energy

BOOKS, JOURNALS, CONFERENCE PUBLICATIONS, AWARDS AND RESEARCH COMMITTEES

BOOKS

Cerone, Pietro and Silvestru Sever Dragomir (2011) *Mathematical Inequalities - A Perspective*. Chapman & Hall/CRC Press: Taylor & Francis Group, United States.

Lai, Daniel, Rezaul Begg and Marimuthu Palaniswami (2011) *Healthcare sensor networks: challenges to practical implementation*. Taylor and Francis, Boca Raton Florida USA.

McAinch, Andrew, Aimee Segman, Regina Belski, Barry O'Mahony and Warren Payne (2011) *Literature Review: Firefighter nutrition and hydration*. Victorian Government, Department of Sustainability and Environment, Melbourne, Victoria, Australia.

XU, Guandong, Yanchun Zhang and Lin Li (2011) *Web mining and social networking*. Springer-Verlag Berlin Heidelberg 2010, Berlin Heidelberg.

BOOK CHAPTERS

Cornall, Lauren, Deanne Skelly, Michael Mathai and Andrew McAinch (2011) Generation and Use of Cultured Human Primary Myotubes. in *Muscle Biopsy*. Ed(s). Sundaram C. InTech, Croatia. 35-64.

Duke, Mikel, J C Diniz da Costa, G Q Lu and P G Gray (2011) Silica Membranes in Fuel Cell Systems. in *Encyclopedia of Nanoscience and Nanotechnology*. Ed(s). H.S. Nalwa. American Scientific Publishers, California, USA. 143-161.

Fu, Lulu and Hong Xu (2011) Chinese Medicine and Integrative Approaches in the Prevention of Breast Cancer - Acupuncture Meridian, Pulsed Electromagnetic Field Test and Chinese Food Therapy. in *Chinese Medicine*. Ed(s). Prof Kuang Haixue. InTech Open Access Publisher, Croatia.

Gray, Stephen, R Semiat, Mikel Duke, A Rahardianto and Y Cohen (2011) Seawater Use and Desalination Technology. in *Treatise on Water Science*. Ed(s). Peter Wilderer. Elsevier B.V., Amsterdam, Netherlands. 73-105.

Kaasar, Golam and Xun Yi (2011) Privacy preserving data gathering in wireless sensor network. in *Network security, administration and management: advancing technologies and practices*. Ed(s). Dulal Kar. IGI Global, .

Kaasar, Golam and Xun Yi (2011) Privacy preserving data gathering in wireless sensor network. in *Network Security, Administration and Management: Advancing Technologies and Practice*. Ed(s). Dulal Kar. IGI Global, USA. 237-251.

O'Brien, Jessica, Mikel Duke and Y.S. Lin (2011) Xylene Separation Performance of Composition-Gradient MFI Zeolite Membranes. in *Inorganic Polymeric and Composite Membrane – Structure, Function and Other Correlations*. Ed(s). S. Ted Oyama, Fred W. Bull Professor of Chemical Engineering, Virginia Tech, Blacksburg, USA. Elsevier, Oxford, UK. 195-212.

O'Brien, Kylie and Stephen Birch (2011) Toyohari Meridian Therapy: Challenges to conventional notions about acupuncture. in *Acupuncture-Clinical Practice, Particular Techniques and Special Issues*. Ed(s). Saad, M. InTech Publishers, Vienna. 99-112.

O'Brien, Kylie and Stephen Birch (2011) Toyohari Meridian Therapy: Challenges to conventional notions about acupuncture. in *Acupuncture-Clinical Practice, Particular Techniques and Special Issues 2011*. Ed(s). Saad M (Ed). InTech Publishers, Vienna. 99-112.

Ozansoy, Cagil and Ruby Heard (2011) Microbial conversion of biomass a review of microbial fuel cells. in *Progress in Biomass and Bioenergy Production*. Ed(s). S Shahid Shaikat. InTech, Rijeka Croatia. 409-426.

Prasad, J., Osaana Donkor and H. Gill (2011) Probiotics and human immune function. in *Lactic acid Bacteria: Microbiological and Functional Aspects*. Ed(s). Salminen S, Ouwehand A and Lahtinen S.. Taylor and Francis, Boca Raton, FL USA.

Preza, C., S. King, Nicoleta Dragomir and Cogswell (2011) Phase Imaging Microscopy – Beyond Darkfield Phase and Differential Interference Contrast Microscopy. in *Handbook of Biomedical Optics*. Ed(s). Boas, D, Pitrís, C and Ramanujam, N. Taylor and Francis, USA. 483-515.

Simcock, Alec and Juan Shi (2011) Problem based learning. in *Engineering education: an Australian perspective*. Ed(s). Dr Steven Grainger, Associate Professor Colin Kestell. Multi science publishing co Ltd, Essex UK. 105-114.

Stojanovska, Lily (2011) Insulin Resistance, Type 2 Diabetes and Role of Insulin Sensitizers in its Management in *Diabeto-Angiology*. Ed(s). Marijan Bosevski. Nova (Biomedical) Science Publishers, Inc., New York, USA. 52-72.

Tao, Xuehong, Zhiqi Shen, Chunyan Miao, Yin Leng Theng, Yuan Miao and Han Yu (2011) Automated negotiation through a cooperative competitive model. in *Innovations in agent based complex automated negotiations*. Ed(s). Takayuk Ito, Minjie Zhang, Valentin Robu, Shaheen Tatima, Tokuro Matsuo and Hirofumi Yamaki. Springer, Berlin Heidelberg. 161-178.

Xu, Guandong (2011) Building user communities of interests by using latent semantic analysis. in *Collaborative search and communities of interest: trends in knowledge sharing and assessment*. Ed(s). Pascal Franca. IGI Global, Hershey, New York USA. 38-69.

JOURNAL ARTICLES

Agana, Bernard, Darrell Reeve and John Orbell (2011) Optimization of operational parameters for a 50 nm ZrO₂ ceramic membrane as applied to the ultrafiltration of post electrodeposition rinse waste water. *Desalination*. 278 (1-3): 325-332.

Ahmed, Shabbir and Michael Faulkner (2011) Optimized Interference Canceling for Colocated Base Station Transceivers. *IEEE Transactions on Vehicular Technology*. 60 (9): 4175-4183.

Ahmed, Sk. Moin, Atif Iqbal, Haitham Abu-Rub, Jose Rodriguez, Christian Rojas and Mohammad Saleh (2011) Simple Carrier-Based PWM Technique for a Three-to-Nine-Phase Direct AC–AC Converter. *IEEE Transactions on Industrial Electronics*. 58 (11): 5014-5023.

Au, Amy, Torben Hackl, Thomas Yeager, Scott Cohen, Harvey Pass, Curtis Harris and Roger Reddel (2011) Teolmerase activity in plerual malignant mesotheliomas. *Lung cancer*. 73 (3): 283-288.

Azhar, Aftab H and B.J.C Perera (2011) Evaluation of Reference Evapotranspiration Estimation Methods under Southeast Australian Conditions. *Journal of Irrigation and Drainage Engineering*. 137 (5): 268-279.

Barua, Shishutosh, AWM Ng and BJC Perera (2011) Comparative Evaluation of Drought Indexes: A Case Study on the Yarra River Catchment in Australia. *Journal of Water Resources Planning and Management*. 134 (2): 215-226.

Basin, Michael, Peng Shi and Dario Calderon-Alvarez (2011) Joint state filtering and parameter estimation for linear stochastic time-delay systems. *Signal Processing*. 91 (4): 782-792.

Basin, Michael and Peng Shi (2011) New advances in H_∞ control and filtering for nonlinear systems. *International Journal of Systems Science*. 42 (5): 705-708.

Basin, Michael, Peng Shi and Dario Calderon-Alvarez (2011) Central suboptimal H_∞ control design for nonlinear polynomial systems. *International Journal of Systems Science*. 42 (5): 801-808.

Bigger, Stephen W. (2011) ChemKinetics: Fundamental Chemical Kinetics Principles and Analysis by Computer Simulation. *Journal of Chemical Education*. 88: 244.

Bodill, Taryn, Anne C. Conibear, Gregory L. Blatch, Kevin Lobb and Perry T. Kaye (2011) Synthesis and evaluation of phosphonated N-heteroarylcarboxamides as DOXP-reductoisomerase (DXR) inhibitors. *Bioorganic and Medicinal Chemistry*. 19: 1321-1327.

Botha, Melissa, Annette N. Chiang, Patrick G. Needham, Linda L. Stephens, Heinrich C. Hoppe, Simone Kulzer, Jude M. Przyborski, Klause Lingelbach, Peter Wipf, Jeffrey L. Brodsky, Addmore Shonhai and Gregory L. Blatch (2011) Plasmodium falciparum encodes a single cytosolic type I Hsp40 that functionally interacts with Hsp70 and is upregulated by heat shock. *Cell Stress and Chaperones*. 16: 389-401.

Bruck, Dorothy, Michelle Ball and Ian Thomas (2011) Fire fatality and alcohol intake: analysis of key risk factors. *Journal of Studies on Alcohol and Drugs*. 72 (5): 731-736.

Boon, Paul I. (2011b) *Rehabilitation of paperbark-dominated wetlands of the Gippsland Lakes Ramsar site*, Victoria. Wetlands Australia: National Wetlands Update, 19: 14-15.

Boon, Paul I. (2011c) *Study reveals threats to Victoria's mangroves and coastal saltmarsh*. Park Watch, 247: 16-17.

Bruck, Dorothy and Ian Thomas (2011) Community based research on the effectiveness of the home smoke alarm in waking up children. *Fire & Materials*.

Carolan, Mary (2011) In individuals with poorly controlled diabetes, a reciprocal peer support programme gives greater 6-month improvement in HbA_{1c} than does nurse care management. *Evidence based Nursing*. 14 (2): 49-50.

Carolan, Mary (2011) The good midwife: Commencing students' views. *Midwifery*. 27: 503-508.

- Carolan, Mary, Maebh Barry, Mary Gamble, Kathleen Turner and Oscar Mascarenas (2011) The Limerick Lullaby project: An intervention to relieve prenatal stress. *Midwifery*.
- Carolan, Mary, Maebh Barry, Mary Gamble, Kathleen Turner and Oscar Mascarenas (2011) Experiences of pregnant women attending a lullaby programme in Limerick, Ireland: A qualitative study. *Midwifery*.
- Carolan, Mary, Mary-Ann Davey, Mary-Ann Biro and Michelle Kealy (2011) Older Maternal Age and Intervention in Labor: A Population-Based Study Comparing Older and Younger First-Time Mothers in Victoria, Australia. *Birth*. 38 (1): 24-29.
- Carolan, Mary, Mary-Ann Davey, Mary-Ann Biro and Michelle Kealy (2011) Maternal age, ethnicity and gestational diabetes mellitus. *Midwifery*.
- Carolan, Mary and Gina Kruger (2011) Concerns among first year Midwifery students: Towards addressing attrition rate. *Contemporary Nurse*. 38 (1-2): 139-147.
- Carolan, Mary and Gina Kruger (2011) Undertaking midwifery studies: Commencing students' views. *Midwifery*. 27: 642-647.
- Chang, Jui-Fang and Peng Shi (2011) Using investment satisfaction capability index based particle swarm optimization to construct a stock portfolio. *Information Sciences*. 181 (14): 2989-2999.
- Cho, Yeol, Silvestru Sever Dragomir and Young Ho Kim (2011) On some Gronwall type inequalities involving iterated integrals. *Math Inequal & Appl*. 14 (3): 605-620.
- Claveria, Joevis and Akhtar Kalam (2011) Power transfer analysis of a hybrid fuel cell/battery as portable power source generator. *Journal of petroleum technology and alternative fuels*. 2 (7): 103-110.
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- Cornall, Lauren, Michael Mathai, Deanne H. Hryciw and Andrew J. McAinch (2011) Diet-induced Obesity Up-regulates the Abundance of GPR43 and GPR120 in a Tissue Specific Manner. *Cellular Physiology and Biochemistry*. 28: 949-958.
- Cornall, Denise (2011) A review of the breastfeeding literature relevant to osteopathic practice. *International Journal of Osteopathic Medicine*. 14 (2): 61-66.
- Cowling, Mary and Patrick Jean Guay (2011) Seasonal variation in size of the gular lobe of a male musk duck *biziura lobata*. *Australian Field Ornithology*. 28 (2): 88-91.
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- Xu, Zhoujia and Xun Yi (2011) Classification of Privacy-preserving Distributed Data Mining protocols. in *Proceeding of ICDIM 2011*. IEEE, Australia. 337-342.
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- Xu, Guandong, Yu Zong, Rong Pan, Peter Dolog and Ping Jin (2011) On kernel information propagation for tag clustering in social annotations systems. in *Knowledge based and intelligent information and engineering systems*. Ed(s). Andreas Konig, Andreas Dengel, Knut Hinkelmann, Koichi Kise, Robert J Howlett and Lakhmi C Jain. Springer Press, Berlin, Heidelberg, Germany. 505-514.
- Xu, Hong (2011) Chinese medicine patterns and integrative diagnostic approaches of type II diabetes. in *The 8th World Congress of Chinese Medicine Proceedings*. Ed(s). Academic group. World Federation of Chinese Medicine, London.
- Yang, Xuebing, Yuan Miao and Zhang Yanchun (2011) Model driven GUI automation for efficient information exchange between heterogeneous electronic medical record systems. in *International conference on information systems development*. Springer, . 799-810.
- Yi, Xun, Raylin Tso and Eiji Okamoto (2011) Three-party Password-authenticated Key Exchange without Random Oracles. in *Proceedings of SECURE 2011*. 15-24.
- Yi, Xun and Eiji Okamoto (2011) Practical mobile electronic election. in *Proceedings of SII 2011*. IEEE, . 1119-1124.
- Yi, Xun and Elisa Bertino (2011) Private searching for single and conjunctive keywords on streaming data. in *Proceedings of WPES 2011*. ACM, 153-158.
- Zhou, Qingbiao, Jie Fang and Guandong Xu (2011) Incorporating Sentiment Analysis for Improved Tag-Based Recommendation. in *First International Conference on Social Computing and Applications*. Ed(s). J.Chen, W.Dou, J.Liu, L.T.Tang and J.Ma. Springer press, Berlin, Germany. 1222-1227.
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Zong, Yu, Guandong Xu, Peter Dolog and Yanchun Zhang (2011) A local information passing clustering algorithm for tagging systems. in *Database Systems for Advanced Applications*. Ed(s). Jianliang Xu, Ge Yu, Shuigeng Zhou and Rainer Unland. Springer Press, Berlin, Heidelberg, Germany. 333-343.

Zong, Yu, Guandong Xu, Pin Jin, Yanchun Zhang, Enhong Chen and Rong Pan (2011) APPECT: An Approximate Backbone-Based Clustering Algorithm for Tags. in *7th International Conference on Advanced Data Mining and Applications*. Ed(s). J. Tang, I.King, L.Chen, and J.Wang. Springer press, Berlin,Germany. 175-189.

CONFERENCE PRESENTATIONS

Farrell, Maureen , Ian Baldwin and Nigel Fealy Speakers. (2011) Use of an electronic clinical experience portal for the education of nurses in a critical care unit. The Transformative Power of Innovation - 19th Australian National Health Informatics Conference (HIC 2011), IOS Press BV Netherlands. Brisbane, Queensland, Australia. 2 August 2011.

Farrell, Maureen Invited Speaker. (2011) Using mobile technologies to improve patient care in acute care units. HIMSS AsiaPac 2011. Melbourne, Victoria, Australia. 20 September 2011.

Freemantle, Russell , Debra Kerr and Kristine Martin-McDonald Speakers. (2011) EN medication study: ENs with medication administration qualification in Victoria and their impact on skill mix, nursing care, workload and job satisfaction. 2011 Professional Issues in Practice. Conference: Our Professions in Focus. Melbourne, Victoria, Australia. 23 June 2011.

Hua, Bin , Peter Ryan, Dinesh Varma, Regina Belski, Kylie O'Brien, Alan Hayes and Lisa Nelson Speakers. (2011) Evaluation of the Efficacy of a Chinese Herbal Medicine in the Treatment of Patients with Osteoarthritis of the Knee. 10th National Emerging Researchers in Aging Conference: Researching Aging Transitions. Sydney, New South Wales, Australia. 24 November 2011.

Imam, Muhammed-Ali , Md Moniruzzaman and M.A. Mamun Speakers. (2011) Anodizing of zinc for improved surface properties. 18th International Corrosion Congress. Perth, WA, Australia. 20/11/2011.

Jegathala Krishnan, Kannan , Akhtar Kalam and Aladin Zayegh Speakers. (2011) Hydrogen optimisation and fuel cell application on electrical distribution system and its commercial viability in Australia by renewable energy sources. 2011 FOHES postgraduate research conference. Melbourne, Australia. Jul-2011.

Kruger, Gina Poster Presentation. (2011) Promoting normal birthing: Endeavouring to develop a midwifery focused scope of practice. Australian College of Midwives 2011: A Midwifery Odyssey. Sydney, Australia. 17 October 2011.

Lai, Chi Yan, Stephen Gray, Mikel Duke and Andrew Groth Poster Presentation. (2011) Preparation and characterisation of poly(vinylidene fluoride)/nanoclay composite membranes. AWA Membranes and Desalination Specialty IV Conference. Surfers Paradise, Goldcoast, Australia. 9 February.

Li, Ke , Hong Xu and Kerry Bennett Poster Presentation. (2011) Development of a valid and reliable assessment tool that integrates Chinese and Western Medical approaches to type 2 diabetes. Australasian Acupuncture & Chinese Medicine Annual Conference. Perth, WA, Australia. 20 May 2011.

Li, Ke and Hong Xu Workshop Convenors. (2011) Using Chinese medicine for the management of type II and pre-diabetes. Australasian Acupuncture & Chinese Medicine Annual Conference. Perth, W.A., Australia. 20 May 2011.

Lu, Sai , Debra Kerr, Louise McKinlay and Douglas Mill Speakers. (2011) Nurses' attitudes toward the introduction of medication administration by enrolled nurses: an Australian study. Fifth Pan-Pacific Nursing Conference and Seventh Nursing Symposium on Cancer Care. Hong Kong. 22/09/2011.

Lu, Sai and Rita Funnell Speakers. (2011) Identifying quality of working life factors that influence registered nurses' career intentions - an Australian study. The 15th International Nursing Research Conference. Madrid, Spain. 15/11/2011.

Scott, Stewart Workshop Participant. (2011) EMS Writing for Publication & EMS Research Workshop. EMS Writing for Publication & EMS Research Workshop - Pre-conference workshop to Paramedics Australasia 2011 National Conference. Sydney, NSW, Australia. 04/10/11.

Stewart, Scott and Elizabeth Thyer Poster Presentation. (2011) Preparedness of International Paramedic Academics to teach Evidence based Practice. Paramedics Australasia 2011 National Conference. Sydney, NSW, Australia. 06/10/11.

Stewart, Scott and Paul Burke Poster Presentation. (2011) UK and Victoria Analgesia Guidelines Compared. Paramedics Australasia 2011 National Conference. Sydney, NSW, Australia. 06/10/11.

Stewart, Scott Speaker. (2011) Educating Gibraltar: The challenges of bringing university education to a tiny, isolated service. Paramedics Australasia 2011 National Conference. Sydney, NSW, Australia. 06/10/11.

Stewart, Scott Speaker. (2011) The UK Paramedic Education System: Learning's of an Australian Paramedic Academic experiences teaching at St George's University, London. Paramedics Australasia 2011 National Conference. Sydney, NSW, Australia. 06/10/11.

Stojanovska, Lily , Cindy Law, Beatrice Lai, Tony Chung and Christopher Haines Speakers. (2011) Translation and cultural adaptation of the quality of life scales into traditional Chinese. World (International) Menopause Society. Rome, Italy. 8 June 2011.

Stojanovska, Lily , Cindy Law, Beatrice Lai, Sarah Forgathy, Tony Chung and Christopher Haines Speakers. (2011) Cultural Adaptation and Translation of Quality of Life Scales into Traditional Chinese. Australasian Menopause Society Congress. Brisbane, Australia. 9 September 2011.

Stojanovska, Lily Speaker. (2011) The Role of Insulin Sensitizers in the Management of Insulin Resistance and Type 2 Diabetes. International Drug Discovery Science and Technology. Shenzhen, China. 3 November 2011.

Thomas, Ian and Dorothy Bruck Speakers. (2011) Hallway smoke alarms: often specified, how effective? Tenth International Symposium of Fire Safety Science. University of Maryland, USA. 19/06/2011.

Thomas, Ian and Dorothy Bruck Speakers. (2011) Smoke alarms in dwellings: occupant safety through timely activation & effective notification. Suppression & Detection Research & Applications: A Technical Working Conference (SUPDET2011). Orlando, Florida, USA. 22/03/2011.

Thomas, Ian Invited Speaker. (2011) Limitations in measuring performance in performance based design. Fire Safety Asia Conference Singapore 2011. Singapore. 12/10/2011.

Thyer, Elizabeth and Georgia Clarkson Poster Presentation. (2011) Logging onto a clinically focused course. Paramedics Australasia. Sydney, NSW, Australia. 6 October 2011.

Xu, Hong Invited Speaker. (2011) Chinese medicine patterns and integrative diagnostic approaches of type II diabetes. Australasian Acupuncture & Chinese Medicine Annual Conference. Perth, WA, Australia. 20 May 2011.

EDITORIAL APPOINTMENTS

Carolan, Mary. Sub Editor, Women and Birth Journal, Australian College of Midwives Inc.

Dragomir, Sever. Editor Advances in Nonlinear Analysis and Applications, Serials Publications, India

Fryer, Gary . Guest Editor, Special Issue for the International Journal of Osteopathic Medicine.

Fryer, Gary. Member, Editorial Committee, International Journal of Osteopathic Medicine

Fryer, Gary. Member, International Advisory Board, Journal of Bodywork & Movement Therapy

Guay, Patrick-Jean Sub editor for Corella, Journal, Australian Bird Study Association

Heslop, Liza Editor, Special Edition for the Electronic Journal of Health Informatics

O'Brien, Kylie. Editorial Advisory Board, Tang International Journal of Genuine Traditional Medicine

O'Brien, Kylie. Editorial Board, Journal of Alternative and Complementary Medicine, Mary Ann Liebert Inc

Perera, Chris. Editor, Journal of Water and Climate Change. International Water Association.

Richardson-Tench, Marilyn Editorial Board, ACORN Journal, Australian College of Operating Room Nurses Inc

Sharda, Nalin Editor, International Journal of Computers and Applications, ACTA Press, Canada.

Sharda, Nalin Reviewer, Journal of Multimedia Tools and Applications, Springer.

AWARDS

The Vice-Chancellor's Citations and Peak Awards for Excellence in Research and Research Training recognise and reward the diverse contributions that individuals and teams make to facilitate high quality research and research training within the University. The Citations and Awards will serve three main objectives

- To provide formal recognition within the University of outstanding achievement in research and research training;
- To provide researchers with recognition useful for external and internal career development and funding opportunities, and
- To provide the University with an opportunity to obtain significant publicity for University research and researchers.

VICE-CHANCELLOR'S CITATIONS AWARDS

Vice-Chancellor's Citation for Excellence in Research and Research Training Research for Staff Category

- Associate Professor Todor Vasiljevic

Research Supervision Category

- Associate Professor Alan Hayes
- Professor Yanchun Zhang

Research Team Category

- The Urban Water Resource Team comprising Professor Chris Perera, Professor Stephen Gray (ISI), Dr Fuchun Huang, Dr Nitin Muttill, Dr Anne Ng, Dr Shobha Muthukumaran and Dr Dung Tran

Early Career Researcher Category

- Dr Daniel Lai

PhD Student Category

- Dr Jianhua Zhang supervised by Professor Stephen Gray and Associate Professor Jun-de Li
- Dr Shishutosh Barua supervised by Dr Anne Ng and Professor Chris Perera

VICE-CHANCELLOR'S PEAK AWARDS

Vice-Chancellor's Career Achievement Award

- Professor Roger Gabb

Vice-Chancellor's Peak Award for Excellence in Research and Research Training – Research for Staff Category

- Associate Professor Todor Vasiljevic

Vice-Chancellor's Peak Award for Excellence in Research and Research Training – Research Supervision Category

- Professor Yanchun Zhang

Vice-Chancellor's Peak Award for Excellence in Research and Research Training – Research Team Category

- The Urban Water Resource Team comprising Professor Chris Perera, Professor Stephen Gray (ISI), Dr Fuchun Huang, Dr Nitin Muttill, Dr Anne Ng, Dr Shobha Muthukumaran, Dr Dung Tran

Vice-Chancellor's Peak Award for Excellence in Research and Research Training – PhD Student Category

- Dr Jianhua Zhang

The Vice-Chancellor's Citations and Awards for Excellence in Learning and Teaching, Early Career Teacher and Programs That Enhance Learning, recognise and reward the diverse contributions that individuals and teams make to facilitate high quality teaching within the University. The Citations and Awards serve three main objectives:

- to provide formal recognition within the University of outstanding achievement in teaching;
- to provide teachers with recognition that is useful for external and internal career development and funding opportunities, and
- to provide the University with an opportunity to obtain significant publicity for University teaching and teachers.

VICE-CHANCELLOR'S CITATIONS AWARDS

Vice-Chancellor's Citation for Excellence in Learning and Teaching Higher Education

- Dr Thinh Nguyen
- Dr Kathy Tangelakis
- Mr Sam Rassaei Kashuk and Prof Graham Thorpe (Architecture and Engineering Design Team)

VICE-CHANCELLOR'S PEAK AWARDS

Vice-Chancellor's Peak Award for Excellence in Learning and Teaching Higher Education

- Dr Thinh Nguyen

RESEARCH COMMITTEE

Chair

Professor Chris Perera

School of Biomedical and Health Sciences

Associate Professor Todor Vasiljevic

Dr Andrew McAinch

School of Engineering and Science

Dr Gitesh Raikundalia

Associate Professor Mary Millikan

School of Nursing and Midwifery

Dr Deb Kerr

Associate Professor Mary Carolan

Centre for Applied Informatics

Professor Yanchun Zhang

Centre for Environmental Safety and Risk Engineering

Professor Graham Thorpe

Centre for Telecommunication and Micro Electronics

Professor Stephen Collins

Institute for Sustainability and Innovation

Professor Stephen Grey

Institute for Sport, Exercise and Active Living

Professor Glenn McConnell

Institute for Logistics and Supply Chain Management

Professor Peng Shi

Centre for Health, Research and Information

Associate Professor Alan Hayes

VU Research Office

Ms Sandy Superina

Dr Lyle Winton

FoHES Faculty Innovation Development Officer

Dr Andrew Rudge

Student Representative

Mr Nilantha Gamage and Mr Prasad Inamdar

POSTGRADUATE RESEARCH COMMITTEE

Chair

Professor Chris Perera

School of Biomedical and Health Sciences

Associate Professor Alan Hayes

Associate Professor Todor Vasiljevic

School of Engineering and Science

Dr Gitesh Raikundalia

Associate Professor Mary Millikan

School of Nursing and Midwifery

Dr Deb Kerr

Associate Professor Mary Carolan

Centre for Environmental Safety and Risk Engineering

Dr Maurice Guerrieri

Centre for Telecommunication and Micro Electronics

Professor Stephen Collins

Institute for Sustainability and Innovation

Professor Paul Boon

Institute for Logistics and Supply Chain Management

Professor Peng Shi

Student Representatives

Mr Mohammedreza Pourakbar

Ms Deanna Horvath

GRANTS

2011 EXTERNAL GRANTS

PROJECT	RESEARCHERS	AGENCY
The Effects of Pharmaceutical and Dietary Modulation of the Endocannabinoid System on Metabolic Dysregulation in Obesity and Type 2 Diabetes Mellitus	Dr A. McAinch, Ms L. Cornall	National Heart Foundation
Investigation of the neurophysiological responses following lumbar manipulation in people with chronic lower back pain.	Dr G. Fryer	Australian Spinal Research Foundation
Developing effective educational material for the dolphin-swim industry in Port Phillip Bay, Victoria, Australia	Dr C. Scarpaci, Ms N. Filby	Victoria University, ANZ Trustees, The Norman Wettenhall Foundation, Ian Potter Foundation
Hybrid Testing Facility for Structures under Extreme Loads	Prof R. Al-Mahaidi, Assoc Prof S. Fragomeni, Dr M. Guerrieri	ARC - Research Infrastructure Equipment and Facilities
Health Knowledge Management	Assoc Prof L. Heslop, Prof W. Chaboyer, Dr B. Gillespie	VU Grant Preparation Support Scheme, ARC - Discovery
Temporal and spatial human disturbance monitoring at the Western Treatment Plant	Dr P. Guay	Melbourne Water Corporation
Implementation of the IEC61850 International Protocol for Accurate Fault Location and Arc Voltage estimation in Overhead Power Lines.	Prof A. Kalam	Energy Networks Association LTD
The effects of different dietary fatty acids and weight loss on endocannabinoid and adiponectin signalling in the skeletal muscle	Dr A. McAinch, Dr D. Skelly, Ms A. Roy	Australian Rotary Health Rotary Fund, Australian Rotary Health Research Fund
Training for Volunteer Researchers in Delma impar and Tympanocryptis pinguicolla monitoring techniques.	Dr M. O'Shea	Victorian National Parks Association Inc
Western Bulldogs Postgraduate Research Scholarship: Nutritional interventions to enhance muscle recovery in high intensity intermittent sport.	Ms E. Walker	Western Bulldogs
Real-time and Self-Adaptive Stream Data Analyser for Intensive Care Management	Prof Y. Zhang, Assoc Prof X. Yi, Dr J. He, M. Steyn, J. Cao	ARC Linkage
Data Exchange and Service Integration with Applications in Health Information Systems	Prof Y. Miao, Prof Y. Zhang	ARC Linkage
"Fibre optic sensor development", Researchers in Business	Prof S. Collins	Enterprise Connect, Department of Industry, Innovation, Science, Research and Tertiary Education
Developing an educational program for high risk women with gestational diabetes	Assoc Prof M. Carolan, Dr M. Farrell	Ian Potter Foundation
Standardised handover to improve nursing care in the Emergency Department	Dr D. Kerr, Ms S. Klim, Prof A. Kelly, Prof T. McCann	Nurses Board of Victoria, Western Health
Improving patient health outcomes in acute care hospital settings using mobile wireless technology and hand held computers	Dr M Farrell, I. McGrath, M. Darcy, M. Wilson	Royal Women's Hospital and Austin Health.
Selection of features with high confidence: Case of biomarker selection for Genome Wide Association Studies	Dr E. Kikianty, Prof P. Cerone, Dr A. Kowalczyk	National ICT Australia (NICTA)
Crumbed, Coated and Frozen Seafood Product	Assoc Prof T. Vasiljevic	Ambaco Pty Ltd
Microparticulation	Assoc Prof T. Vasiljevic	Fonterra
Germinated grains – sources of bioactives	Assoc Prof T. Vasiljevic, Assoc Prof L. Stojanovska, Dr O. Donkor	Sanitarium
Evaluation of a Non-Chemical Pulsed-Power technology as a antifouling pre-treatment for reverse osmosis desalination membranes	Dr T. Yeager, Prof S. Gray, Prof J. Orbell, Dr H. Ridgeway (Aquamem consultants/Stanford University) and Dr M. Dixon (South Australia Water)	National Centre for Excellence in Desalination Australia (NCEDA)
Literature Review – Lupin Processing	Dr N. Datta, Dr O. Donkor, Assoc Prof T. Vasiljevic	Australasian Lupin Processing Pty Ltd
Water Conservation by Replacing Cooling Towers	Assoc Prof J. Li, Prof G. Thorpe, Dr J. Rojter, Prof S. Bigger, Prof S. Gray	Smart Water Fund
Pterostylis orchids ecology and conservation genetics	Dr R. Robinson	Victorian Department of Sustainability and Environment
Evaluating the impacts of human disturbance on waterbirds	Dr P.J. Guay, Dr M. Weston (Deakin Uni), Dr R. Robinson	Melbourne Water Corporation, Victoria University
Hybridisation between introduced Mallards and pacific Black Ducks in Australasia	Dr. P.J. Guay, Dr R. Robinson, Dr M. O'Shea, Dr J. Johnson	Victoria University of Wellington; Birds Australia-Victoria; Field Naturalist Club of Victoria; Birds Australia; M.A. Ingram Trust; Bired Observation and Conservation Australia; Institute for Sustainability and Innovation.
Factors determining habitat selection by birds in coastal habitats in Western Port, Victoria	Prof Paul Boon	City of Casey, ISI

PROJECT	RESEARCHERS	AGENCY
Impact of Tourism on Marine Wildlife	Dr Carol Scarpaci	Victorian Department of Primary Industry, ANZ Trustees, Birds Australia-Victoria, Dolphin Swim Australia, Port Stephens Fisheries Institute, New Zealand Department of Conservation, Ian Potter Foundation.
Factors affecting recruitment in populations of Spiny Rice-flower (<i>Pimelea spinescens</i> subspecies <i>spinescens</i> Rye.) in Victoria's natural temperate grasslands	Dr M. O'Shea, Dr R. Robinson	<i>Pimelea spinescens</i> Recovery Group
Community based Legless Lizard monitoring program	Dr M. O'Shea	Victorian National Parks Association
The Effect of Dietary Fish Peptides on Biomarkers of Human Health - The Influence of Processing Conditions and the Environment.	Assoc Prof T. Vasiljevic, Assoc Prof M. Mathai, Dr O. Donkor	Ambaco
Nutrition and Dietetics in High Performance Sports	Ms E. Walker, Dr A. McAinch, Dr R. Aughey	Western Bulldogs, ISEAL
The effect of <i>Caralluma Fimbriata</i> on food associated behaviour in children with Prader-Willi syndrome	Assoc Prof M. Mathai, Dr X. Su, Dr A. McAinch	AZPA
Effects of Morosil on weight loss	Assoc Prof M. Mathai, Dr X. Su, Dr A. McAinch	AZPA
The Rational Development of Improved Pre-conditioning Agents for the Removal of Oil Contamination from Wildlife and Rocky Foreshore	Prof J. Orbell, Dr L. Ngeh, Prof S. Bigger	ARC Linkage, Phillip Island Nature Park
Implementation of the IEC61850 International Protocol for Accurate Fault Location and Arc Voltage estimation in Overhead Power Lines	Prof A. Kalam	ENA, ASTP
Development of a Research Facility for Testing for IEC61850 Protection System	Prof A. Kalam	API ,SEL , ABB , GE, CSE Uniserve
Multi-objective planning and operation of water supply systems subject to climate change	Prof C. Perera, A. Barton	Grampians Wimmera Mallee Water
Rapid detection methods for blue green algae	Assoc Prof M. Millikan, Prof S. Gray	Grampians Wimmera Mallee Water
Strategies for Retrofitting Stormwater Harvesting in Existing Urban Areas	Prof C. Perera, Dr A. Ng, A. Sharma	CSIRO
Water Conservation by Replacing Cooling Towers	Assoc Prof J Li	Smart Water
Nanophotonic Resonators	Prof G Baxter, Dr A Roberts;	ARC - Discovery
Private Data Warehouse Query	Assoc Prof X Yi	ARC - Discovery
The Rational Development of Improved Pre-conditioning Agents for the Removal of Oil Contamination from Wildlife and Rocky Foreshore	Prof J Orbell, Dr L Ngeh, Prof S Bigger	ARC - Linkage
Data Enhancement, Integration and Access Services for Smarter, Collaborative & Adaptive Whole-of Water Cycle Management	Prof Y Zhang; Dr X Zhou	ARC - Linkage
Sustainability and Excellence in Australia's Power Engineering	Prof A Kalam	The Australian Power Institute Limited
Diabetes Project	Dr D Chew, Dr R Quiazon	Westgate General Practice Network
The Effect of Dietary Fish Peptides on Biomarkers of Human Health - The Influence of Processing Conditions and the Environment	Assoc Prof T Vasiljevic, Assoc Prof M Mathai, Dr O Donkor	ARC - Linkage
Realising Community Benefits from Improved Building Regulations	Prof D Proe	OneSteel Manufacturing Pty Limited
Iramoo: Environmental Sustainability in Action	Dr C Hocking	Department of Education and Early Childhood Development
Data Exchange and Service Itegration with Applications in Health Information Systems	Assoc Prof Y Miao, Prof Y Zhang;	ARC - Linkage
Multi-Objective Planning and Operation of Water Supply Systems Subject to Climate Change	Prof C Perera	GWMWATER
Strategies for Retrofitting Stormwater Harvesting in Existing Urban Areas	Dr A Ng, Prof C Perera	CSIRO
Economic & Environmental Impact Analysis fo Sewerage Network: A Comparison Study of Sewerage Network due to Centralized & Decentralized Servicing Options on Tropical Island	Dr N Muttil	CSIRO
Design of Low Level Liquid Slashing Absorbers: Effect of Surface Roughness and Wall Inclination	Assoc Prof O Turan	CSIRO
Impact and management of the dolphin-swim industry in Port Phillip Bay, Victoria.	Dr C Scarpaci, Dr PJ Guay	ANZ Trustees
Trace metals in little penguin (<i>eudyptula minor</i>) populations along the Victorian coastline of Australia.	Dr C Scarpaci, Dr PJ Guay	ANZ Trustees
Impact of obesity on protein handling by the kidney.	Dr D Skelly	Helen Macpherson Smith Trust

PROJECT	RESEARCHERS	AGENCY
Margin statistics of high throughput sequencing.	Dr E Kikianty	Australian Mathematical Sciences Institute (AMSI)
Adaptive Web Service Integration and Mashup in Cloud Computing	Dr Y Zhang	Nanjing University of Finance & Economics
Ecology of waterfowl at the WTP	Dr PJ Guay	Melbourne Water Corporation
Deciphering Attitudes, Exploring Barriers and Facilitator Towards Eliminating Restraint and Seclusion in Inpatient Aged Psychiatry Units.	Prof T McCann	Helen Macpherson Smith Trust
The role of voltage-gated Na ⁺ and Ca ²⁺ channels in post-inflammatory hyperexcitability of enteric neurons	Dr K Nurgali	NHMRC - Projects
Managing disturbance to waterbirds at the Western Treatment Complex: Understanding the basic patterns.	Dr PJ Guay, Dr M Weston	Melbourne Water Corporation
Hybridisation between Pacific Black Ducks and Mallards in Victoria.	Dr PJ Guay	Birds Australia
Is nebulised doxorubicin-containing nanoparticles a better way to treat pulmonary metastases?	Dr C Dass	ANZ Trustees
Green Justice.	Dr C Hocking;	Department of Justice (Victorian)
Cognitive Radio Technology	Prof M Faulkner	ARC - Discovery
Privacy Protection in Distributed Data Mining	Assoc Prof Xun Yi, Prof Y Zhang	ARC - Discovery
Fibre Bragg Grating Microstructures: A Novel Sensing Tool?	Prof S Collins, Dr S Wade, Prof G Baxter	ARC - Discovery
Impact and Management of the Dolphin-Swim Industry in Port Phillip Bay, Victoria, Australia.	Dr C Scarpaci	The Hermon Slade Foundation

2011 INTERNAL GRANTS

PROJECT	RESEARCHERS	AGENCY
Fabrication of high performance erbium doped silica optical fibres	Dr F. Sidiroglou	VU Researcher Development Grant Scheme
Pilot study using in-situ sensors for monitoring corrosion in water mains.	Dr D. Tran, Prof S. Collins, Dr F. Sidiroglou	VU Researcher Development Grant Scheme
Sustainability, effectiveness and acceptability of a new form of shift-to-shift bedside nursing handover.	Dr D. Kerr, Dr L. Lu	VU Researcher Development Grant Scheme
Regulation of pro-metastatic uPA/uPAR system by PEDF and its impact on growth and spread of various types of tumours.	Dr C. Dass	VU Researcher Development Grant Scheme
Is part of the metabolic dysfunction of dystrophin-deficient mdx mouse muscle due to concurrent reductions in neuronal nitric oxide synthase?	Dr E. Rybalka, Assoc Prof A. Hayes, Prof G. McConell	VU Researcher Development Grant Scheme
Screening of 1500 South Pacific marine plant/invertebrate extracts for discovery and characterisation of novel anticancer compounds.	Dr C. Dass	VU Researcher Development Grant Scheme
Human – waterbird conflicts: determination of suitable buffer zones for Australian dabbling and grazing waterfowl	Dr P. Guay, Dr C. Scarpaci	Faculty Collaborative Research Grant Scheme
Algae for Wastewater Treatment and Biofuels	Assoc Prof J. Li, Professor S. Hussainy, Assoc Prof M. Millikan	Faculty Collaborative Research Grant Scheme
A System Protection Framework for Cloud Computing based on Data Mining Techniques	Prof Y. Zhang, Dr J. He	Faculty Collaborative Research Grant Scheme
Early detection of cyanobacteria and toxins in rural Victoria using on-site detection fluorescence; ultra-violet and infrared spectrometry	Assoc Prof M. Millikan, Mr E. Ostarcevic, Prof S. Gray	Faculty Collaborative Research Grant Scheme
Assistance in the management of chronic disease via a mobile phone-accessed nutritional database	Dr M. Mathai, Dr A. McAinch	Faculty Collaborative Research Grant Scheme
Converting Waste brown Coal Fly Ash into Sustainable Building Materials	Dr N. Gamage	Faculty Collaborative Research Grant Scheme
Mechanisms Triggering Post-Inflammatory Hyper excitability of Enteric Neurons	Dr K. Nurgali	Faculty Collaborative Research Grant Scheme
The Evaluation of Commercial In-process Membrane Cleaning Agents in the Food Industry	Dr N. Datta, Prof J. Orbell	Faculty Collaborative Research Grant Scheme
Motivated Web Mining and Empirical Study Platform	Prof Y. Zhang	Faculty Collaborative Research Grant Scheme
Private Searching on Streaming Data	Assoc Prof X. Yi	Faculty Collaborative Research Grant Scheme

GRADUATIONS

2011 GRADUATIONS

CATHERINE ANDERSON, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Similarity in Adverse Pressure Gradient Turbulent Flows

CITATION: Catherine Anderson's thesis is about understanding a group of complex, but common, engineering flows, to be able to predict them accurately for better engineering designs. All three examiners rated the thesis as being of very high quality, remarking that Cathy's work is "very exhaustive and valuable" and "an important addition to our knowledge of these flows". Cathy's Principal Supervisor was Associate Professor Ozden Turan.

GRADUATION: June 2011

VANDANA BASSOO, PhD

CENTRE FOR TELECOMMUNICATIONS AND MICROELECTRONICS

THESIS TITLE: A Digital Up-Conversion Architecture for Future High Efficiency Wireless Base Stations

CITATION: Vandana's thesis proposed a new up-conversion architecture for an all-digital 'green' wireless base station. Her work was focussed on developing a new generation of highly efficient radio frequency power amplifiers for the fourth generation (4G) of mobile phone systems. She has published 3 journal papers, 3 conference papers and has co-authored a book chapter. Vandana's Principal Supervisor was Professor Michael Faulkner.

GRADUATION: June 2011

CURRENT ROLE: Lecturer, Department of Industrial Systems Engineering, School of Innovative Technologies and Engineering, University of Technology, Mauritius

SHISHUTOSH BARUA, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Drought Assessment and Forecasting Using a Nonlinear Aggregated Drought Index

CITATION: Shishutosh has investigated problems in the existing drought assessment and forecasting approaches, and developed an innovative approach for drought assessment and forecasting which makes a significant contribution to the knowledge on drought quantification and prediction. As the recognition of his work, he received "Best Research Poster Presentation Award" at the IEEE Science and Engineering Graduate Research Expo in 2009. Shishutosh's Principal Supervisor was Dr Anne Ng and his Associate Supervisor was Professor Chris Perera

GRADUATION: June 2011

CURRENT ROLE: Water Resources Modeller/Policy Officer, Department of Sustainability and Environment

BELINDA DAVIS, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Identification and Characterisation of Bacterial Genes Associated with Resistance to and/or Degradation of Environmental Pollutants

CITATION: Microbial decontamination of polluted environments is a widely adopted but poorly understood practice. Belinda's research provides considerable insight into the genetics of heavy metal resistance and hydrocarbon degradation and has led to publications in international journals. The examiners praised Belinda's work for its perceptiveness and contribution to knowledge on microbial mechanisms associated with pollutant detoxification. Belinda's Principal Supervisor was Associate Professor Grant Stanley and her Associate Supervisor was Dr Mrinal Bhawe.

GRADUATION: June 2011

MUDITHA DISSANAYAKE, PhD

SCHOOL OF BIOMEDICAL AND HEALTH SCIENCES

THESIS TITLE: Modulation of Functional Properties of Whey Proteins by Microparticulation

CITATION: Muditha's work has gained substantial international recognition for introducing a novel approach to stabilising valuable whey proteins by microparticulation. A thorough experimental assessment used in the study delivered fundamental understanding of how these novel ingredients could be used in various food applications and substantially expanded scientific knowledge in this area. Muditha's Principal Supervisor was Associate Professor Todor Vasiljevic.

GRADUATION: June 2011

CURRENT ROLE: Research Associate, RMIT

SARAH LOUISE FOGARTY, PhD

SCHOOL OF BIOMEDICAL AND HEALTH SCIENCES

THESIS TITLE: Understanding and Treating Eating Disorders from a Traditional Chinese Medicine Perspective

CITATION: Sarah examined how Traditional Chinese Medicine understands eating disorders, including the use of acupuncture as an adjunct therapy. This thesis has made a significant contribution to the knowledge of eating disorders and the use of acupuncture, including the notion of improved quality of life and reduced anxiety. The findings of this study have been published in two quality journals. Sarah's Principal Supervisor was Professor Lily Stojanovska and her Associate Supervisor was Dr Andrew McAinch.

GRADUATION: Oct 2011

CURRENT ROLE: Trial Coordinator and Researcher at University of Western Sydney

MICHEAL DRIEBERG, PhD

CENTRE FOR TELECOMMUNICATIONS AND MICROELECTRONICS

THESIS TITLE: Channel Assignment Strategies for Throughput Enhancement in High Density Wireless Local Area Networks

CITATION: Micheal investigated channel assignment in high density wireless local area networks. His thesis has made significant contributions to the development of channel assignment strategies that not only provide better performance but can also be applied in real networks. Both the theoretical and practical impact of this work has been widely recognised through several publications in internationally renowned journals and conferences. Micheal's Principal Supervisor was Professor Michael Faulkner and his Associate Supervisors were Associate Professor Fu-Chun Zheng and Dr Sverrir Olafsson.

GRADUATION: June 2011

RITA FUNNELL, PhD

SCHOOL OF NURSING AND MIDWIFERY

THESIS TITLE: Opinions of Registered Nurses about Quality of Working Life in Victoria's Public Hospitals

CITATION: Rita explored the opinions held by nurses working in Victoria's public hospitals about quality of working life. Her thesis contributes to a greater understanding of the impact of quality of working life related factors upon nurses' decisions to change career and informs the development of effective interventions for tackling the nursing workforce shortage faced by the public healthcare system. Rita's Principal Supervisor was Dr Lucy Lu and her Associate Supervisor was Associate Professor Jim Sillitoe.

GRADUATION: June 2011

CURRENT ROLE: Senior Higher Education Consultant, ARJAY Books and Educational Services

NUR ASYIK HIDAYATULLAH, MASTERS BY RESEARCH

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Impacts of Distributed Generation on Smart Grid

CITATION: Nur investigated the impact of distributed generation on smart grid identifying stability of the system, such as power angle, frequency and voltage. The simulation results utilising DIG-SILENT Power Factory Software shows that SVC makes the grid smarter because of its ability to improve system stability through voltage enhancement either by injecting or absorbing reactive power during integration of distributed generation.

GRADUATION: June 2011

CURRENT ROLE: University Lecturer, Indonesia.

GOLAM KAOSAR, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Privacy Preserving Protocols for Association Rule Mining using Cryptographic Techniques

CITATION: The research investigated the key issues behind data privacy in association rule mining and also proposed several privacy preserving protocols. The thesis has resulted in a good number of papers being published from the research. Mr Kaosar is currently a member of the research staff in the School of Engineering and Science at Victoria University. Md. Golam's Principal Supervisor was Dr Xun Yi and his Associate Supervisor was Professor Yanchun Zhang.

GRADUATION: Oct 2011

CURRENT ROLE: Victoria University, Research Assistant.

FARIAL JAFAR, PhD

SCHOOL OF ENGINEERING & SCIENCE

THESIS TITLE: Flow Fields and Heat Transfer of Liquid Films Falling on Horizontal Cylinders

CITATION: The freshness of horticultural produce can be maintained for longer if it is cooled immediately after harvest. Spraying produce with chilled water is effective, but the physics of this process is very complicated because it involves air, liquid water and solids. Fariar's thesis uses powerful computing methods to elucidate the factors that determine the rate of cooling of fresh produce. Fariar's Principal Supervisor was Professor Graham Thorpe and her Associate Supervisor was Associate Professor Ozden Turan.

GRADUATION: Oct 2011

MATTHEW LAMB, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Monitoring the Structural Integrity of Packaging Materials Subjected to Sustained Random Loads

CITATION: Matthew's research resulted in innovative techniques for detecting minute changes in the structural integrity of materials during random loading experiments. His work is of great significance for optimising protective packaging systems and, ultimately, reducing the consumption of material used for packaging. Matthew's work has been accepted for publication in highly-ranked journals and well-received, with citations, at national and international conferences. Matthew's Principal Supervisor was Associate Professor Vincent Rouillard and his Associate Supervisor was Associate Professor Michael Sek.

GRADUATION: June 2011

CURRENT ROLE: Victoria University, Lecturer and Researcher

GOPARANJAN MOHAPATRA, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: The Electrical Stability and Compliance Requirements for Connecting Wind Energy Generators to the Australian Power Grid

CITATION: Goparanjan investigated the electrical stability and compliance requirements of wind energy integration to the Australian power grid through his research is on the operation of a wind-farm connected to the grid. The resulting findings are new and exciting, yielding significant benefit to transmission and distribution grid operators as well as providing mitigating strategies for greenhouse gas emission whilst meeting growing demand. Goparanjan's Principal Supervisor was Professor Akhtar Kalam.

GRADUATION: June 2011

CURRENT ROLE: Electrical Engineer/ Project Manager, Infratil Energy Australia Pty Ltd

MARK SCARR, PhD

INSTITUTE FOR SUSTAINABILITY AND INNOVATION

THESIS TITLE: The Use of Stomatal Frequency from Three Australian Evergreen Tree Species as a Proxy Indicator of Atmospheric Carbon Dioxide Concentration

CITATION: Mark examined if stomatal frequency in three Australian evergreen temperate tree species had the potential to track atmospheric CO₂ concentration and demonstrated a relationship in two test species. This information may be used to estimate palaeo-CO₂ levels and provide an insight into past and future climate change. Mark is employed at Victoria University and has published papers on his work. Mark's Principal Supervisor was Dr Carol Scarpaci and his Associate Supervisor was Associate Professor David Greenwood.

GRADUATION: June 2011

CURRENT ROLE: Victoria University, Lecturer and Researcher

ABDUL KADER MUSTAFA, PhD

CENTRE FOR TELECOMMUNICATIONS AND MICROELECTRONICS

THESIS TITLE: Signal Conditioning for High Efficiency Wireless Transmission

CITATION: Future 'green' wireless transmitters will need to be wideband as well as energy efficient to reduce battery consumption while operating with data throughputs in excess of one Giga-bit per second. Mustafa developed new signal conditioning algorithms to improve the bandwidth capabilities of a new generation of highly efficient radio frequency power amplifiers. His work has led to 2 journal papers and 5 conference papers. Abdul's Principal Supervisor was Professor Michael Faulkner.

GRADUATION: June 2011

CURRENT ROLE: Lecturer, James Cook University in Queensland and MBA at Canberra University

CARSTEN SENGPIEHL, PhD

INSTITUTE FOR LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THESIS TITLE: Towards the Development of a Holistic Planning Framework for a Logistics City-Cluster: A Multinational Modified Delphi Study

CITATION: Carsten developed a Logistics City-Cluster framework that was derived from, and validated by executive experts. The framework has potential for the efficient planning of metropolitan areas, in order for them to achieve competitive advantage as a supply chain location. Recently, aspects of this framework have been adapted to inform guidelines for the Victorian State Government and the Western Metropolitan Region of Melbourne. Carsten's Principal Supervisor was Professor Peng Shi and his Associate Supervisors were Professor Pieter Nagel and Associate Professor Jim Sillitoe.

GRADUATION: Oct 2011

CURRENT ROLE: Account Manager, Linfox Australia Pty Ltd

HUSSEIN MAHANNY SHEHAB, MASTERS BY RESEARCH

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Study of Creep Characteristics of Multi-layered Corrugated Fibre Board Protective Cushions.

CITATION: Hussein Shehab investigated how the creep properties of pre-compressed multi-layered fibreboard cushions are influenced by moisture. Models were developed to simulate creep based on exponentially decaying expressions, adapted and fitted to experimental creep data using non-linear optimisation curve fitting techniques.

The research assists in prediction of the behaviour of pre-compressed multi-layered fibreboard cushions for packaging applications exposed to humid conditions such as found in tropical warehouse storage.

GRADUATION: 2011

SHU SUN, MASTERS BY RESEARCH

SCHOOL OF BIOMEDICAL AND HEALTH SCIENCES

THESIS TITLE: The Evaluation of Chinese Therapeutic Food for the Treatment of Dyslipidemia

CITATION: This research has provided further laboratory and clinical evidence on the safety and effectiveness of Chinese therapeutic food in preventing and treating dyslipidemia. The thesis makes a valuable contribution to the understanding of the place of Chinese therapeutic foods in the treatment of contributing factors in the development of a most serious health problem, especially when the Chinese Medicine profession in Australia moves to National Registration in 2012.

GRADUATION: June 2011

CURRENT ROLE: Chinese medicine practitioner

GRAEME SMITH, PhD

SCHOOL OF BIOMEDICAL AND HEALTH SCIENCES

THESIS TITLE: Dietary and Exercise Manipulation of Skeletal Muscle Function in Older Humans

CITATION: Graeme examined the effects of whey protein consumption on muscle strength, body composition and substantially refined measurements of redox status. He showed that increasing protein in the elderly diet will not offset the effects of aging. However, a study on protein-enriched meal replacements demonstrated their potential as a key weight loss strategy. Graeme is the Chief Scientific Officer at MyGene. Graeme's Principal Supervisor was Dr Alan Hayes and his Associate Supervisor was Dr Paul Lewandowski.

GRADUATION: June 2011

CURRENT ROLE: Chief Scientific Officer, MyGene

ZHUOJIA XU, MASTERS BY RESEARCH

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Analysis of Privacy-preserving Distributed Data Mining Protocols

CITATION: Distributed data mining applications, such as those dealing with health care, finance, counter-terrorism and homeland defence, use sensitive data from distributed databases held by different parties. This comes into direct conflict with an individual's need and right to privacy. This thesis studies the features and performance of privacy-preserving distributed data mining protocols published from 1999 to 2009. Zhuojia's Principal Supervisor was Associate Professor Xun Yi and his Associate Supervisor was Professor Yanchun Zhang.

GRADUATION: 2011

CURRENT ROLE: Centrelink Data Analyst

SUI PAN YAM, PhD

CENTRE FOR TELECOMMUNICATIONS AND MICROELECTRONICS

THESIS TITLE: Higher Order Diffraction Wavelengths of Fibre Bragg Gratings and Applications

CITATION: Optical fibre Bragg gratings are filters inscribed within a fibre through illumination with ultraviolet light using a phase mask. The research showed how certain unexplained features in the optical spectra of gratings arise from the complex refractive index pattern generated via this process. The work has been presented at international conferences and published in three international refereed journal articles. Sui's Principal Supervisor was Associate Professor Stephen Collins and his Associate Supervisor was Professor Gregory Baxter.

GRADUATION: June 2011

CURRENT ROLE: Regional Sales Manager, Binoptics Corp, Hong Kong

JIANHUA ZHANG, PhD

INSTITUTE FOR SUSTAINABILITY AND INNOVATION

THESIS TITLE: Theoretical and Experimental Investigation of Membrane Distillation

CITATION: Jianhua's thesis examined many fundamental issues of membrane distillation, so that waste or solar heat may be efficiently utilised in the treatment of industrial wastewaters. He identified membrane properties required for high performance, leading to the development of a theoretical model for understanding the membrane distillation process. Jianhua has published five high-quality journal articles from the research. He is currently a Postdoctoral Fellow at Victoria University. Jianhua's Principal Supervisor was Professor Stephen Gray and his Associate Supervisor was Associate Professor Jun-De Li.

GRADUATION: Oct 2011

CURRENT ROLE: Post Doctoral Researcher, Institute of Sustainability and Innovation, Victoria University.

XUEBING YANG, PhD

SCHOOL OF ENGINEERING AND SCIENCE

THESIS TITLE: Graphic User Interface Modelling and Testing Automation

CITATION: The Graphic User Interface (GUI) plays a very important role in contemporary software. Although GUI testing is essential for providing high quality software, it is extremely tedious and time consuming. This research proposes a set of novel models for GUI testing automation. The research outcome advances both theoretical and empirical studies facilitating software engineers to carry out GUI testings efficiently and effectively. Xuebing's Principal Supervisor was Professor Yuan Miao and his Associate Supervisor was Professor Yanchun Zhang.

GRADUATION: Oct 2011

STUDENT RECOGNITION

DR JIANHUA ZHANG

Winner, Vice Chancellor's Citation and Peak Award in Research and Research Training - PhD Student Category and Research Degree Graduate of the Year.

Dr Jianhua Zhang won the Vice Chancellor's Citation and Peak Award in Research and Research Training - PhD Student Category and Research Degree Graduate of the Year 2011 Vice-Chancellor's Awards

Dr Zhang received the peak award based on:

- The quality of his thesis
- The number of published journal and conference papers, and
- His engagement in research

Dr Zhang completed his PhD with the Institute for Sustainability and Innovation (ISI) in just less than three years.

He published seven journal papers on membrane distillation, focussing on the effect of membrane compressibility on performance.

During his PhD he actively co-operated with CSIRO, Suncheon National University (Korea) and research staff in ISI.

GEORDIE ZHANG

Winner, Victoria University – 3 Minute Thesis Competition

Victoria University student Geordie Zhang best explained his PhD topic to a non-specialist audience to win the \$2000 prize and a trip to Perth, in the University's second annual three-minute thesis contest.

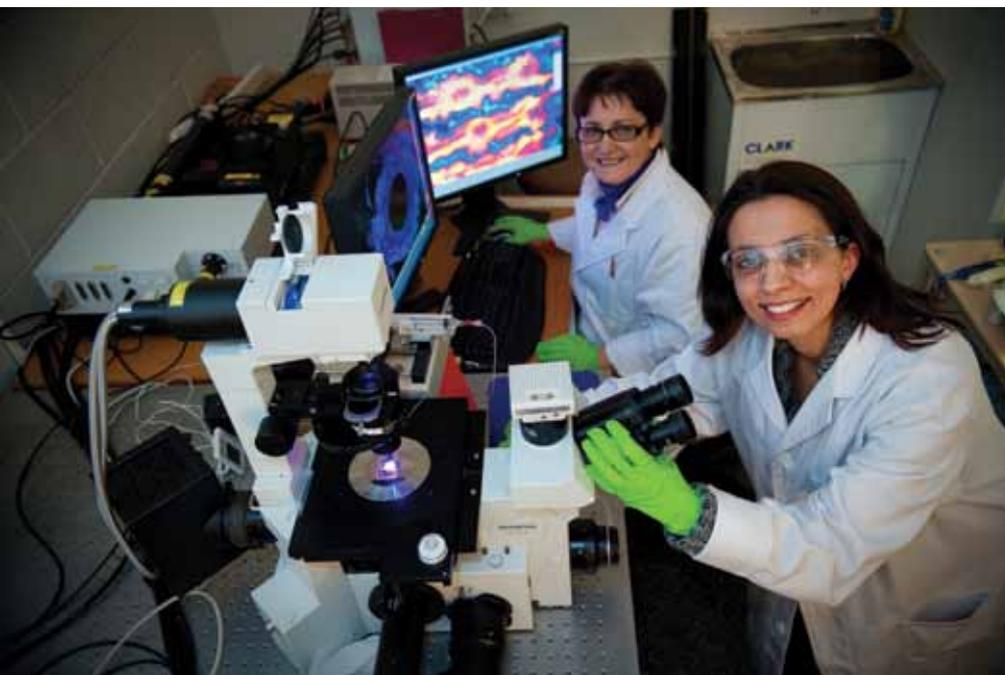
Mr Zhang also competed in the Trans-Tasman finals at the University of Western Australia on the 29th of September, 2011 for the \$5000 first prize. But the 28-year-old Maribyrnong student has already beaten seven other VU finalists to get this far.

The contest, hosted by the university's Office of Post-Graduate Research, invites doctoral candidates to present a compelling and clear oration on their thesis topic to a non-specialist audience in less than three minutes.

Mr Zhang, who studies at VU's Centre for Telecommunications and Microelectronics, explained his research using a theory of economics that prioritises competing uses of broadband communication based on their importance.

The most important uses, such as medical operations done by telecommunications in remote areas, get a higher ranking and more network capacity than people playing Angry Birds.

The official title of Mr Zhang's thesis is Adaptive Interference and Intermodulation Cancellation in Cellular Communication Networks.



2011 UNDERGRADUATE/ GRADUATE RESEARCH SCHOLARSHIPS

This program is offered to students who are nominated for the program by Undergraduate Course Coordinators and external organisations to the Associate Dean (Research and Research Training) based on the following assessment:

- Student's Academic Achievement in the previous year
- Student's Academic Achievement over an extended period of time
- Graduate's interest in undertaking Postgraduate Studies at Victoria University
- Participant's capacity to complete a Research Project within a defined period of time, with quality outcomes
- Participant's potential to complete a paper for publication as a result of the scholarship being offered

RECIPIENTS OF THE 2011 UNDERGRADUATE/ GRADUATE RESEARCH SCHOLARSHIP

JAY AGUILA

Bachelor of Science – Nutrition Food and Health Science
Nutrition for Sports Performance

SARAH BARBY

Bachelor of Science – Dermal Therapy
An Investigation into the entry requirements and subsequent graduate outcomes of Dermal Therapy Students

KATRINA CAREY

Bachelor of Midwifery
Gestational Diabetes - A case study

MARLEE HICKMAN

Bachelor of Science – Nutrition Food and Health Science
The indigenous plant, *Carpobrotus rossii* (CR) ("pigface") and its effect of antioxidant properties on colon cancer cells (HT29) and liver cell lines (HepG2)

GABRIELA HILTY

School of Biomedical and Health Science
The seed production of the native plant *Ptilotus macrocephalus* found in native grasslands and woodlands

ANDREW HO-PENG

Bachelor of Science – Nutritional Therapy
Does *Caralluma fimbriata* extract play a role in obesity treatment?

LAURENT LEPAGE

Bachelor of Engineering – Mechanical Engineering
Calibration of a high speed laser profilometer for road topography surveys

KATE MCKAY

Bachelor of Nursing
Attitudes of emergency department patients about handover at the bedside

LUCINDA MONIE

Bachelor of Science
A morphological and genetic analysis of the *Cymbidium erythraeum* complex

SHAAN NAUGHTON

Bachelor of Science – Nutritional Therapy
Interaction of micronutrient supplementation and diet on energy metabolism and weight loss

MICHAEL O'CONNOR

Bachelor of Science – Biomedical (Deakin University)
The Mechanisms of Doxorubicin in Cancer Cell Death

BENJAMIN POMROY

Bachelor of Engineering – Civil Engineering
Spatio-temporal analysis of rainfall trends over the Yarra River catchment

DAVINA TAYLOR

Western Helath
The determinants of epidural analgesia during childbirth for women who present to Sunshine hospital

JAMIE TRATT

School of Biomedical and Health Science (RMIT University)
Effect of leptin and endocannabinoids on normal homeostasis



