

Summary of Linkage Projects Proposals for Funding to Commence in 2007

Victoria

RMIT University

LP0776260 Prof KJ Horadam; Prof LM Batten; A/Prof S Boztas; Dr TD Ebringer; Mr J Kaminski

Approved Project Title **Analysis and classification of malicious code**

2007 : \$ 60,258

2008 : \$ 115,017

2009 : \$ 107,017

2010 : \$ 52,258

Primary RFCD 2805 DATA FORMAT

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

CA

Administering Organisation RMIT University

Project Summary

Malicious software such as viruses and worms directly attacks the security, privacy and integrity of Australian e-commerce, large databases and communication channels. The recent uptake of malicious software by organised crime has made finding effective countermeasures more urgent. Around 80% of the malicious code in circulation is disguised in some way. This significantly increases the difficulty of automated detection and delays analysis. Automated classification and de-obfuscation technologies are a precondition to applying more sophisticated detection heuristics. The project will be instrumental in safeguarding Australia by protecting critical infrastructure and defending us from online organised crime and information warfare.

LP0776834 Dr R Horne; Prof M Berry; Dr JE Kellett; Prof S Hamnett

Approved Project Title **Lifetime Affordable Housing in Australia: Integrating environmental performance and affordability**

2007 : \$ 54,500

2008 : \$ 113,000

2009 : \$ 115,000

2010 : \$ 56,500

Primary RFCD 3199 OTHER ARCHITECTURE, URBAN ENVIRONMENT AND BUILDING

APA(I) Award(s): 3

Collaborating/Partner Organisation(s)

VicUrban

Building Commission

LAND MANAGEMENT CORPORATION

Administering Organisation RMIT University

Project Summary

Existing dwellings and the locations of suburban housing with respect to employment centres result in significant greenhouse gas emissions. Water and other environmental issues are also important in housing performance, and there is currently a perceived trade-off between these factors and the affordability of housing. For the first time in Australia, this study will focus on overcoming this apparent policy dilemma. The research will inform future housing policy in strengthening Australia's economic and social fabric, while contributing towards Australia's National Research Priority 1 'Environmentally Sustainable Australia'. Outcomes will provide significant national economic, social, water use and greenhouse gas benefits for Australia.

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LP0776656 Dr SD Jones; Dr JG Ferwerda; Dr GJ Fitzgerald; Dr GJ O'Leary; Dr RK Belford
Approved Project Title **Water and nutrient stress detection in broad acre crops using remote sensing**
2007 : \$ 57,000
2008 : \$ 108,500
2009 : \$ 101,500
2010 : \$ 50,000
Primary RFCD 2910 GEOMATIC ENGINEERING

Collaborating/Partner Organisation(s)

Victorian Department of Primary Industries

Administering Organisation RMIT University

Project Summary

The national benefit of the remote sensing of water and nutrient levels in crops comes from improved agricultural practice; leading to cost savings, reduced water usage and reduced pollution. This benefit will arise since irrigation and fertiliser application can be exactly tailored to the measured needs of broad-acre crops. In Australia, water is a scarce resource. Reducing consumption by irrigators will have significant downstream benefits. By remote measurement of nutrient variation within paddocks, fertiliser applications can be optimised. Minimum excess fertiliser will then be present and this will minimise runoff and potential downstream water pollution.

LP0776730 A/Prof DK Kumar; Prof X Yu; A/Prof NM McLachlan; A/Prof RK Begg
Approved Project Title **Building a Smart Diagnostic System for Low Back Ailments**
2007 : \$ 21,311
2008 : \$ 42,527
2009 : \$ 42,289
2010 : \$ 21,072
Primary RFCD 2915 BIOMEDICAL ENGINEERING

Collaborating/Partner Organisation(s)

Medec Ltd

Administering Organisation RMIT University

Project Summary

This research will develop an early back ailment diagnostic system that will reduce the recurrence of low back pain, and hence reduce the cost to the health system. This is significant to the community from prevention of pain, to the health care system that spends billions of dollars combating this modern day ailment and towards the industry where the low back pain is the single largest reason for sick leave in Australia. It will also give rise to employment of skilled technical people and an opportunity to increase high-value exports from Australia.

LP0776235 Dr M Lech; A/Prof NB Allen
Approved Project Title **Diagnosis of depressive disorder and risk for depression in adolescents using acoustic speech analysis**
2007 : \$ 39,006
2008 : \$ 76,506
2009 : \$ 72,500
2010 : \$ 35,000
Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

ORYGEN Research Centre

Administering Organisation RMIT University

Project Summary

Depression is the most common mental health problem in young people in Australia. Early diagnosis can minimise the disturbance of typical functioning and development of social and academic skills. Current assessment techniques consume significant time in urgent clinical situations, where an immediate assessment of risk is required. An automatic diagnostic system will provide an important objective indicator giving an immediate quantitative assessment of the mental state of a patient. The quantitative measure given by the diagnostic system proposed will give physicians and therapists an improved metric by which they can gauge the effectiveness of various treatments in reducing depression and suicidality.

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LP0776812 Prof PJ Marriott; Prof MJ Adams; Dr PM Wynne; Dr WL Winniford

Approved Project Title **Advanced Separation Technologies and Chemometric Data Processing for Macromolecular Materials and Metabolite Profiling**

2007 : \$ 47,500

2008 : \$ 82,500

2009 : \$ 65,000

2010 : \$ 30,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

SGE International Pty Ltd
The Dow Chemical Company

Administering Organisation RMIT University

Project Summary

The project will develop innovative separation technologies for specialised materials, which could lead the scientific export industry in Australia, with employment benefits to the community. Partner, Dow has links with researchers around the world, and this project will allow Australian researchers to access the network of Dow laboratories and projects and develop a long-term relationship. The analysis methods to be developed will focus on metabolite profiling which has relevance to a broad range of biological monitoring activities from human health, to plant genetics and breeding. New generation polymer materials will be characterised by using the new techniques developed. The methods will be platform technologies for future studies eg. anti-terrorism bio- and chemo-monitoring.

LP0776931 A/Prof DG McCulloch; Prof ED Doyle; Dr SJ Dowey; Dr MZ Jahedi

Approved Project Title **Designing the Next Generation of High Performance Cutting Tools**

2007 : \$ 57,500

2008 : \$ 107,500

2009 : \$ 95,000

2010 : \$ 117,500

2011 : \$ 72,500

Primary RFCD 2914 MATERIALS ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Sutton Tools Pty Ltd

Administering Organisation RMIT University

Project Summary

In order for Australian manufacturers to improve their global competitiveness in the production of manufactured goods it is essential to have access to cost effective high performance cutting tools. This project seeks to meet this challenge by exploiting new pathways in the development of advanced metallic-based vapour deposited coatings. This new approach will provide a much needed opportunity for value adding in the economically significant area of tribological coatings for industrial components. The outcomes of this project will directly impact on the ability of Sutton Tools, an Australian owned company, to sustain and expand its export markets while adding more broadly to the competitiveness of Australia's manufacturing industry.

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LP0776870 Prof F Roddick
Approved Project Title **Enhancing the productivity of wastewater desalination**

2007 : \$ 17,559
2008 : \$ 30,372
2009 : \$ 25,627
2010 : \$ 12,813

Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Melbourne Water

Administering Organisation RMIT University

Project Summary

Climate change is causing reduced rainfall over much of populated Australia. New technology to enable membrane desalination of wastewater treatment effluent will be developed to provide secure reliable water supplies for Australian (and international) urban and regional communities. Application of the technology to Western Treatment Plant at Werribee will provide up to 10 gigalitres/year of recycled water to the local agricultural, business and tourism precincts. The economy, community and environment will benefit due to reduced use of potable, river and ground water. Wide application of this technology to wastewater and brackish water will lead to similar benefits and an environmentally sustainable Australia.

LP0776721 A/Prof DR Swinbourne; Prof MA Reuter; Mr R Matuszewicz

Approved Project Title **Innovative thermodynamic process control - the key to sustainable metal use**

2007 : \$ 12,813
2008 : \$ 25,627
2009 : \$ 25,627
2010 : \$ 12,813

Primary RFCD 2913 METALLURGY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Ausmelt Limited

Administering Organisation RMIT University

Project Summary

Large amounts of electronic goods such as computers and mobile phones are discarded each year in Australia. They contain both valuable and toxic metals so dumping them as landfill is unacceptable. Australia has a smelting method which could be adapted to reprocess this waste to recover the valuable metals, returning them for reuse. It would also safely handle the toxics. This project will determine the appropriate smelting strategies and control methods. As a result, transportation of toxic materials overseas will be eliminated, environmental hazards will be reduced and our sustainable use of metals will be increased.

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LP0776616 A/Prof JR Wolfram Cox; Prof OE Hughes

Approved Project Title **New Police Management - From Command and Control to Collaborative Governance: An assessment of organisational change at Victoria Police**

2007 : \$ 35,000

2008 : \$ 62,000

2009 : \$ 61,500

2010 : \$ 56,500

2011 : \$ 22,000

Primary RFCD 3602 POLICY AND ADMINISTRATION

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Victoria Police

Administering Organisation RMIT University

Project Summary

Changes in governance will be assessed and refined in order to assist Victoria Police to become more proactive and collaborative in achieving its strategic aims of intelligent, confident, community and partnership policing and thereby to make a difference to community safety over the next five years. Proactive collaboration at all levels will help Victoria Police to protect communities from terrorism and crime in contemporary conditions and will assist in the safeguarding of Australia. More generally, the results of the project will assist the accumulation of research-based evidence to inform policy making based on the claimed benefits of decentralisation in police forces around the world.