

## Queensland

### Queensland University of Technology

**DP0773348** Prof CA Boyd

**Approved Project Title** **Cryptographic Protocols: Proofs and Designs**

**2007 :** \$76,000

**2008 :** \$74,000

**2009 :** \$72,000

**Primary RFCD** 2805 DATA FORMAT

**Administering Organisation** Queensland University of Technology

#### Project Summary

Cryptographic protocols are the foundation for protection of the critical electronic communications infrastructure on which much of commerce and industry rely. They will increasingly be required in emerging technologies such as ad-hoc wireless networks and sensor networks. This project will provide the ability to design new and efficient protocols with a mathematical guarantee of security. The resulting practical protocols will benefit all users of electronic communications who require security for their information. This includes the financial industries, government, commerce and domestic users.

**DP0770507** Prof RG Broadhurst

**Approved Project Title** **Building rule of law capacity in a transitional state: lessons from the Australian criminal justice assistance programme in Cambodia 1997-2007**

**2007 :** \$82,000

**2008 :** \$80,000

**2009 :** \$60,000

**Primary RFCD** 3904 LAW ENFORCEMENT

**Administering Organisation** Queensland University of Technology

#### Project Summary

Australian overseas aid has recently stressed funding better governance and security as pre-requisites to poverty reduction and economic development. This study evaluates the effectiveness of a long term legal assistance programme designed to strengthen the rule of law in a fragile state such as Cambodia. Police reform in fragile states has often failed and lessons learnt by the CCJAP over the past 10 years will contribute to our knowledge about the best practices and strategies needed to improve security and governance in fragile states. Capacity building efforts to improve international law enforcement cooperation, especially in regard to counter-terrorism and transnational crime, will benefit from this review.

**DP0773341** Prof PD Bruza; Prof KC Van Rijsbergen; Prof S Malin

**Approved Project Title** **The Quantum Mechanics of Semantic Space**

**2007 :** \$85,000

**2008 :** \$80,000

**2009 :** \$75,000

**Primary RFCD** 2801 INFORMATION SYSTEMS

**Administering Organisation** Queensland University of Technology

#### Project Summary

Quantum mechanics (QM) is a well known and successful theory from physics which has recently attracted quite some public interest. Quantum Mechanics is emerging out of physics and permeating into other areas, for example, information retrieval, human language and cognition. This offers tantalizing possibilities and bizarre implications, some of which, if realized, can lead to genuine breakthroughs in producing information technology to enhance human awareness in increasingly complex information environments. Through this project, Australia has the possibility to be at the forefront and have a hand in determining such developments.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0771825** Prof SA Christensen; Prof DE Fisher; A/Prof PA O'Connor; Prof WD Duncan

**Approved Project Title** **An Institutional Framework to Facilitate Sustainable and Integrated Natural, Cultural and Built Resources Governance**

**2007 :** \$80,000  
**2008 :** \$75,000  
**2009 :** \$75,000

**Primary RFCD** 3901 LAW

**Administering Organisation** Queensland University of Technology

### Project Summary

Effective management of natural and cultural resources for sustainability is an urgent national priority. The laws and policies governing land ownership and use are outdated, complex, disjointed and fail to provide coherent information to decision makers responsible for managing natural and cultural resources. This presents a significant barrier to ensuring sustainable development of resources jeopardising Australia's future environmental well being. This research aims to be the first to provide a legal and policy framework which integrates land ownership and principles of sustainable development to facilitate greater understanding and management of our environmental and social obligations for future generations.

**DP0773649** Prof JL Dale; A/Prof RM Harding; Dr MB Dickman

**Approved Project Title** **Plant transformation: exploiting anti-apoptosis genes for very high efficiency transformation**

**2007 :** \$130,000  
**2008 :** \$120,000  
**2009 :** \$110,000

**Primary RFCD** 3002 CROP AND PASTURE PRODUCTION

**Administering Organisation** Queensland University of Technology

### Project Summary

Crop improvement through genetic modification depends on the ability to transform target species. The most desirable method is Agrobacterium mediated transformation. However, plant species and cultivars differ significantly in their ability to be efficiently transformed by Agrobacterium. This is particularly true for the economically important cereals. We have discovered that anti-apoptosis genes, which inhibit programmed cell death, dramatically increase the Agrobacterium transformation efficiency in bananas and sugarcane. We will utilise this information and develop the use of these genes to increase the efficiency of transformation in those crops and cultivars that are difficult to transform using Agrobacterium.

**DP0773185** A/Prof SJ Danby; A/Prof M Emmison; Prof J Potter; Dr A Hepburn; Dr J Cromdal; Dr KM Oswaldsson

**Approved Project Title** **The impact of technological modality on troubles telling and advice giving on a national children's helpline**

**2007 :** \$60,000  
**2008 :** \$60,000  
**2009 :** \$55,000

**Primary RFCD** 3802 LINGUISTICS

**Administering Organisation** Queensland University of Technology

### Project Summary

Over half a million children and young people contact the Kids Help Line every year. They make contact through telephone calls, emails and online interactive chats. This study of these differing types of contact will advance knowledge of children and young people's social and emotional health, the national priority area Promoting and maintaining good health. It informs the counselling, health and educational communities. It addresses key priorities identified in National policy documents on children and young people. Finally, the study will have direct relevance for professional training in telephone and computer mediated forms of communication for counsellors, young people, educators, health professionals and policy makers.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0773706** Prof EP Dawson; Prof SG Corones; Prof W Lane; Dr SV Russell; Dr AJ McCullagh

**Approved Project Title** **Technical and Legal Models for Virtual Info-Sharing Networks (VISN) for Critical Infrastructure Protection (CIP)**

**2007 :** \$130,000  
**2008 :** \$127,000  
**2009 :** \$125,000

**Primary RFCD** 2805 DATA FORMAT

**Administering Organisation** Queensland University of Technology

### Project Summary

This project has substantial national benefit because it will result in the design of a virtual information sharing network (VISN) that will better protect Australia's critical infrastructure. It will provide a comprehensive legal/technical analysis of the requirements/characteristics necessary for the development of a VISN. The development of a secure environment for a VISN will improve industry trust and confidence in participating in the sharing of sensitive information; especially the disclosure of potential vulnerabilities or ascertained potential threats. The project will improve information dissemination speeds and assist post information disclosure controls.

**DP0773012** Prof CJ Fidge; A/Prof AH ter Hofstede; Dr M Dumas-Menjivar

**Approved Project Title** **Rapidly Locating Items in Distribution Networks with Process-Driven Nodes**

**2007 :** \$90,000  
**2008 :** \$100,000  
**2009 :** \$100,000

**Primary RFCD** 3502 BUSINESS AND MANAGEMENT

**Administering Organisation** Queensland University of Technology

### Project Summary

Safety-critical product recalls are a major public health issue in Australia. Recent extortion attempts involving poisoning of chocolate bars, paracetamol tablets and biscuits have demonstrated the urgent need for improved ways of locating commercial products that have been released into the community. Existing product recall tools are effective only within regulated manufacturing and warehousing facilities. This project will develop novel techniques for locating items in large-scale distribution networks driven by complex logistic processes. The outcomes of the project will make it easier to rapidly and accurately pinpoint product locations outside controlled facilities, thus contributing to both cost savings and public safety.

**DP0774092** Prof A Ghosh

**Approved Project Title** **Electricity Distribution in the Bush: Operation, Control and Energy Management of Grid Connected Distributed Generation Based Microgrids**

**2007 :** \$85,000  
**2008 :** \$85,000  
**2009 :** \$85,000

**Primary RFCD** 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

**Administering Organisation** Queensland University of Technology

### Project Summary

Increasing the access of electricity by conventional means to remote areas requires a substantial increase in generating and transmission capacities over what is presently available. These will require large capital expenditure and will increase the levels of emissions of carbon dioxide and various nitrous oxides. As an alternative distributed generation (DG) using renewable energy resources and alternative fuels can be used to mitigate environmental impacts and cost. This project will contribute to the knowledge of operating a microgrid based on various DG energy sources that will be environmentally friendly and renewable. Community and economic benefits will flow from increased diversity of supply and reduced environmental impacts.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0771918** Prof BV Kabanoff

**Approved Project Title** **Economic short-termism among Australian firms: A longitudinal investigation of managers' temporal perspectives and their relation to firm strategy and performance.**

**2007 :** \$60,000

**2008 :** \$76,000

**Primary RFCD** 3502 BUSINESS AND MANAGEMENT

**Administering Organisation** Queensland University of Technology

### **Project Summary**

The Business Council of Australia (2004) indicated its concern about the effects of short termism on Australia's future economic prosperity. We assess whether the attention managers give to the present and future when describing firms' strategies in annual reports has changed during 1992-2006. One of the key effects of short-termism is to reduce firms' focus on innovation. The project offers a direct, unobtrusive indicator of the time frame firms use to shape their strategies. Such evidence helps policy makers decide whether policy action is required; investors determine the seriousness of the problem in different business sectors, and creates a strong foundation for pursuing further research into the possible causes.

**DP0774408** Prof A Luke; Prof SJ Grieshaber

**Approved Project Title** **Family literacy practices, pedagogy and achievement in year one: A quantitative sociological study**

**2007 :** \$118,000

**2008 :** \$180,000

**2009 :** \$120,000

**Primary RFCD** 3301 EDUCATION STUDIES

**Administering Organisation** Queensland University of Technology

### **Project Summary**

Who succeeds and fails in the first year of school literacy? Why and how? Standards and methods for teaching initial literacy are the topic of national policy debate. Yet the debate often is based upon generic and populist claims about the efficacy of instructional methods, relying upon small scale and overseas studies. This is the first large scale quantitative study of variable sociodemographic factors, home experiences, instructional treatment and literacy achievement. It addresses policy debates on phonics, early intervention and standards. It will offer guidance for the development of early childhood curriculum strategies and programs.

**DP0773109** A/Prof CK Mechefske

**Approved Project Title** **Improved patient care and image resolution in magnetic resonance imaging**

**2007 :** \$110,000

**2008 :** \$60,000

**2009 :** \$60,000

**Primary RFCD** 2905 MECHANICAL AND INDUSTRIAL ENGINEERING

**Administering Organisation** Queensland University of Technology

### **Project Summary**

A better understanding of the vibration within MRIs would result in techniques to both improve the image resolution and lower the noise emissions. Direct improvement of health care for Australians will result. Both the patient and the working environment around these scanners will improve as well as image resolution. Presently imaging is possible at the cellular scale, but only through improved MRI stability will imaging reach the molecular level. Medical research that is linked to MRI imaging can be expected to advance in step with improved image resolution. The resulting knowledge could also be used in other research and industrial areas, including micro- and nano-scale devices, where vibration is a critical performance limiting factor.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0773733** Mr GJ Nicholson; A/Prof A Hillman; Prof GC Kiel; A/Prof ML Alexander

**Approved Project Title** **Director identity, identification and information flows as predictors of board monitoring, resource provision and organisational performance**

**2007 :** \$59,000

**2008 :** \$68,000

**2009 :** \$81,000

**2010 :** \$40,000

**2011 :** \$40,000

**Primary RFCD** 3502 BUSINESS AND MANAGEMENT

**Administering Organisation** Queensland University of Technology

### Project Summary

Improving the corporate governance of companies has the potential to significantly and profoundly improve our national wealth and social capital. A 0.5% performance gain in listed companies would create an extra \$50B for the 55% of Australians that invest in equity markets. Systemic governance improvements can lower the cost of capital for the nation, thus improving our international competitiveness. Our findings equally apply to the important not-for-profit sector. Finally, corporate collapses harm shareholders, employees, suppliers creditors and the general community. Quite simply, the ethical and social fibre of society reflects the ethics and values of corporations built into our governance system.

**DP0773230** Dr GJ Pettet; Dr J Malda; Prof DL McElwain

**Approved Project Title** **Human skin equivalent constructs: enhanced culturing and application of laboratory-grown skin through mathematical modelling and in silico experimentation.**

**2007 :** \$79,000

**2008 :** \$77,000

**2009 :** \$75,000

**Primary RFCD** 2399 OTHER MATHEMATICAL SCIENCES

**Administering Organisation** Queensland University of Technology

### Project Summary

Laboratory-grown human skin equivalent constructs, given social and legislative imperatives, will be critical for advances in novel treatment protocol definitions for wound repair, dermatological screening of pharmaceuticals and fundamental studies of skin diseases.

In silico studies undertaken in this project will make a significant contribution to the effectiveness of the application of human skin constructs, by delivering new and deeper insights into the interplay between dependent processes that regulate the behaviour of skin, in vivo or ex vivo. The models and the researchers associated with this project will drive innovative studies in medical science over the next decade.

**DP0774497** Dr F Zare; Prof A Ghosh; Prof F Blaabjerg; Prof Dr RD Lorenz

**Approved Project Title** **Low Loss Distributed Wind Generators with Reduced Electromagnetic Interference and Shaft Voltage Based on Multilevel Converters**

**2007 :** \$66,000

**2008 :** \$65,000

**2009 :** \$65,000

**Primary RFCD** 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

**Administering Organisation** Queensland University of Technology

### Project Summary

Distributed wind generators with minimum electromagnetic interference and bearing spikes are very important for the Australian energy industry because they are an environmentally friendly energy source. Predicting and reducing electromagnetic interferences and mechanical failures in wind farm systems is an important issue especially for the next generation of wind systems when fast and advanced power electronic switches can create more EMI noise for both onshore and offshore wind farms. Medium-Voltage Direct Current (MVDC) systems have good performance and low losses, and are of particular interest to states which are close to wind power sources.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0773544** Dr AJ Zele; Dr D Cao; Prof J Pokorny

**Approved Project Title** **Psychophysical Assessment of Receptoral and Post-Receptoral Visual Function**

**2007 :** \$89,000

**2008 :** \$77,030

**2009 :** \$80,000

**Primary RFCD** 3801 PSYCHOLOGY

APD Dr AJ Zele

**Administering Organisation** Queensland University of Technology

### **Project Summary**

Visual function and performance can be degraded under dim light levels. This occurs in many indoor settings, emergency lighting and road traffic lighting conditions. Approximately 45% of all Australian road traffic fatalities occur under dim lighting conditions. My data will be unique, as it will provide accurate parameters to better design mesopic lighting environments to maximize visual function and performance. This work will help to optimise road traffic lighting for the early recognition of obstacles and dangerous situations. The research program will make important scientific contributions to understanding human visual function and performance at dim light levels.