

New South Wales

University of Technology, Sydney

DP0773412 Dr L Cao

Approved Project Title **Domain-Driven Actionable Link Discovery**

Project Title

2007 : \$75,000

2008 : \$75,000

2009 : \$75,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Organisation University of Technology, Sydney

Project Summary

Driven by emergent data mining applications such as detecting terrorist and distributed fraudulent activities, this project will deliver effective techniques and algorithms for discovering isolated yet important links dispersed across related enterprise information systems. The outcomes will enable Australia to play a significant role in the new link discovery area. They will empower Australian organizations with powerful data mining capabilities to deal with critical cross-organization problems, for instance, counter-terrorism, cross-market surveillance, auditing surveillance and social network analysis. They will enhance Australian social security, compliance and life quality through smart information use.

DP0772104 Prof S Challa; Dr MR Morelande

Approved Project Title **Generalized Information Fusion and Scheduling for Effective Situational Awareness**

Project Title

2007 : \$78,755

2008 : \$80,500

2009 : \$82,500

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Organisation University of Technology, Sydney

Project Summary

Research on the generalized information fusion will lead to better surveillance, monitoring & situational awareness technologies that will significantly enhance our national security and contribute to the strategic directions set by the Nation. It will deliver generic integrated uncertainty reasoning models, algorithms and implementations and will lead to enhanced interoperation capability across multiple collaborating organizations that have surveillance and situational awareness as their prime responsibilities (defence, police and the road transport authority). It will position the nation to use its relatively small defence force to maximum effectiveness in combating terrorism, crime and natural disasters like Tsunami & Earth quakes.

DP0773965 Prof C Chiarella; Ms T To

Approved Project Title **The Modelling and Assessment of Credit Default Risk**

Project Title

2007 : \$130,000

2008 : \$140,000

2009 : \$180,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Organisation University of Technology, Sydney

Project Summary

This project will deliver an enhanced set of methodologies for the quantification and management of credit default risk. These outcomes will benefit researchers both in academia and in Australian financial institutions as research into credit risk has been active in recent years, due to the impending adoption by financial institutions of the Basel II accord on risk assessment. The outcomes will provide a strong academic methodology applied to credit default risk by Australian financial institutions and the Australian financial regulator. This research has the potential to enhance the competitiveness of Australia's financial sector.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773579 Dr TI Dreher

Approved Project Title **News and Community Conflict: examining the role of journalism in local conflict and conflict resolution**

2007 : \$85,270

2008 : \$93,524

2009 : \$77,030

Primary RFCD 4001 JOURNALISM, COMMUNICATION AND MEDIA

APD Dr TI Dreher

Administering Organisation University of Technology, Sydney

Project Summary

The project will place Australia at the leading edge of research on news and conflict. It will contribute an evaluation of the local possibilities for news and conflict resolution to wider international debates on the media in wartime. The research will benefit the Australian journalism profession, journalism educators, policymakers and organisations involved in addressing local level and intercommunal conflicts. An accessible report will provide case studies, strategies and recommendations for the media's role in situations of conflict. By developing a complex, cultural understanding of news audiences and news impacts the research will contribute to processes of change and improvement within the Australian news media.

DP0773776 Dr X He; Prof C Chiarella

Approved Project Title **Dynamic Asset Pricing and Portfolio Decision Rules under Heterogeneous Expectations and Adaptive Learning**

2007 : \$115,000

2008 : \$120,000

2009 : \$165,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Organisation University of Technology, Sydney

Project Summary

The outcomes of this project will provide two benefits to Australian financial market researchers in academe, in industry and financial market regulators. First, a better theoretical and empirical foundation for understanding and analysing optimal portfolio decision rules in a setting that captures many realistic features of market behaviour such as heterogeneity of investor types and adaptive behaviour by market participants. Second, new tools to more effectively understand and manage portfolio risk in financial markets. Consequently Australia will have a more efficient and competitive financial system. It also has the potential to lead to the development of more finance related industries such as financial market software.

DP0774207 Prof DB Hoang; A/Prof E Lawrence

Approved Project Title **Sensor and Actor Grid for Assistive Healthcare**

2007 : \$105,000

2008 : \$105,000

2009 : \$100,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Organisation University of Technology, Sydney

Project Summary

Australia's population is ageing, with a significant, projected increase in the number of people aged over 65. This project addresses the core issue of providing an end-to-end assistive healthcare loop to maintain the wellness as well as improving the quality of life of this ageing population. It promises to reduce the enormous cost of public and primary healthcare. Furthermore, with the proposed framework, an end user will be able to enjoy the support of multiple caregivers (relatives, community-caregivers, etc.) working collaboratively. These factors certainly relate this project to the strengthening of Australia's social and economic fabric priority.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0774247 Prof MP Keane

Approved Project Title **Effects of Maternal Work, Day Care Use and Other Investments in Children on Child Cognitive Outcomes**

2007 : \$115,000

2008 : \$115,000

2009 : \$115,000

Primary RFCD 3404 ECONOMETRICS

Administering Organisation University of Technology, Sydney

Project Summary

Later life outcomes due to investments by individuals and/or society in children is crucial to many countries, including Australia. Appropriate policy responses require reliable and valid estimates of the likely effects of individual investments and policy interventions. Despite many research reports on this topic, almost all do not control for selection bias (eg, high achieving mothers tend to put children in day care), which is a feature of our work. Thus, our empirical results will have major policy implications, and will suggest ways to obtain similar results for Australian environments.

DP0774142 Prof JJ Louviere; A/Prof DJ Street; Dr N Wasi; Dr PZ Wang

Approved Project Title **Investigating Linkages Among Individual Decision Rules, Properties of Experimental Designs and Choice Models In Environmental Economics Applications**

2007 : \$70,000

2008 : \$106,000

2009 : \$110,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Organisation University of Technology, Sydney

Project Summary

Discrete Choice Experiments or 'stated preference' (SP) surveys are increasingly being used to estimate public benefits of proposed environmental policy changes. The accuracy of environmental policy analyses and forecasts of welfare changes based on SP models depends heavily on unbiased parameter estimates. Our project aims to assess what happens if common assumptions about consumer preferences in SP surveys are violated. We also study whether exploratory analysis methods can detect the violations to guide future research and applications. Successful completion of this project will lead to more accurate policy analyses and forecasts based on discrete choice models.

DP0774025 A/Prof DC McKnight; Prof B McNair

Approved Project Title **A study of political commentary in the outlets of a major media corporation**

2007 : \$67,258

2008 : \$97,095

2009 : \$32,294

Primary RFCD 4001 JOURNALISM, COMMUNICATION AND MEDIA

Administering Organisation University of Technology, Sydney

Project Summary

This project will analyse the political commentary published or broadcast in the media outlets of a major media corporation and explore whether political commentators and columnists in these outlets share an agenda of conservative populism. The project will impact on a public policy debate on cross-media ownership and its consequences. It will enhance the international scholarly debate on media ownership and its connections with the content of mass media.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0771882 Prof E Platen

Approved Project Title **Large-Scale Simulation Methods for Measuring Financial Performance under the Benchmark Approach**

2007 : \$95,000
2008 : \$95,000
2009 : \$95,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Organisation University of Technology, Sydney

Project Summary

All working Australians are now required to belong to superannuation schemes. Hence, the measurement of financial performance safely, efficiently, and over long time horizons is of particular importance to Australia. One outcome alone of this research will be the provision of a technology to optimize the long term performance of superannuation funds. More generally, the results will allow better decision-making and integrated, strategic planning for financial institutions and insurance companies. An additional outcome will be global growth for the sectors of Australia's IT industry developing innovative simulation based hardware and software, since the new simulation methods have wide applicability.

DP0773558 A/Prof PJ Ralph; Prof A McMinn; Prof M Kuehl

Approved Project Title **Bio-optical model of Antarctic sea-ice algae photosynthesis**

2007 : \$90,000
2008 : \$88,000
2009 : \$85,000

Primary RFCD 2704 BOTANY

Administering Organisation University of Technology, Sydney

Project Summary

Antarctica contains no permanent human population; however the impact of climate change is being observed. Sea-ice is slowly becoming less thick and covering smaller areas of the Southern Ocean. Algae grow on the underside of this sea-ice which feed krill, which in turn support most of the Antarctic food web. Understanding how changes in sea-ice and snow thickness will change the productivity of Antarctica will have significant implications to our management of this wilderness. Knowledge of how sea-ice algae responds to changes in light can be incorporated in climate change models.

DP0773234 A/Prof AM Sanagavarapu; A/Prof KP Esselle; Dr TS Bird

Approved Project Title **A Three-Dimensional Ultra-Wideband Microwave Method Based On Multiple Antennas For Early Detection Of Breast Cancer**

2007 : \$146,786
2008 : \$125,073
2009 : \$110,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Organisation University of Technology, Sydney

Project Summary

Breast cancer is the most common cause of cancer-related death among women in Australia. In 2003, it killed 2,713 women in Australia and approximately 400,000 worldwide. Despite significant advances, current breast screening methods still suffer from several limitations. They may miss as many as 15% of cancers. Inconclusive results are common, leading to invasive, expensive and painful follow-up tests such as biopsies. About 75% of such biopsies are found to be negative, and this is a major deterrent for women in undertaking breast screening. The proposed project contributes to the cause of finding a more reliable breast cancer detection method, and hence, saving thousands of lives each year.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773822 Dr G Searle; Prof KB O'Connor

Approved Project Title **Reconceptualising industry sector development within the contemporary Australian city: The case of the information technology sector**

2007 : \$65,000

2008 : \$73,000

2009 : \$59,000

Primary RFCD 3704 HUMAN GEOGRAPHY

Administering Organisation University of Technology, Sydney

Project Summary

This project will aim to uncover the reasons why Australia's Information Technology industry is ranked low among OECD countries by evaluating the impact of global and urban geography of the sector on the sector's performance. It will show how policies to achieve more advanced IT sector development need to consider Australia's distinctive position in the global economy and particular factors in the Sydney and Melbourne IT clusters that both help, and hinder, development in ways not considered in present policy models.

DP0773136 A/Prof RJ Steele

Approved Project Title **An Innovative Framework and Techniques for Trusted Mobile Interaction**

2007 : \$30,118

2008 : \$30,618

2009 : \$22,618

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Organisation University of Technology, Sydney

Project Summary

Emerging mobile applications such as mobile commerce, location-based services and wireless sensor networks promise to have an enormous impact in business, society, health and defence and be the next technological wave. However for successful real-world deployment, for reasons of privacy, safety and business efficacy users must be able to have trusted interactions. This project will contribute to Australia's ICT innovation and international competitiveness by developing dynamic, generic, scalable and extensible techniques for trusted mobile interaction. Resulting benefits will be world-leading enabling technology facilitating the creation of novel mobile services and products with potential productivity benefits and export opportunities.

DP0772690 Prof S Vigneswaran; Prof RM Ben Aim; Prof M Elimelech

Approved Project Title **An Optimal Integrated Immersed Membrane System as Pre-Treatment for Reverse Osmosis Desalination**

2007 : \$80,000

2008 : \$80,000

2009 : \$60,000

Primary RFCD 2908 CIVIL ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

This project will be useful for both coastal and inland areas of Australia. It will provide sustainable technology to meet the needs of water supply where the main sources are seawater and brackish water. Reverse osmosis (RO) is the dominant technology in water desalination and in the final polishing step in wastewater treatment for reuse. The novel pre-treatment proposed in this study is the key for the cost-effective and energy efficient operation of RO. This project will strengthen research links among Australian, European and USA universities, to come up with a forefront pre-treatment technology for RO desalination. The technology is of direct benefit to ongoing RO installations in Australia and also has significant export potential.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773592 Prof M Williams; Prof P Gärdenfors

Approved Project Title **Planning, Communication, and Collaboration in Cognitive Systems: A Constructive Approach**

2007 : \$89,000

2008 : \$83,000

2009 : \$86,000

2010 : \$89,000

Primary RFCD 3803 COGNITIVE SCIENCE

Administering Organisation University of Technology, Sydney

Project Summary

Change is a constant and unavoidable characteristic of the current and foreseeable business environment. Currently systems cope poorly with change and as a result they are not sufficiently dependable and adaptable to support business agility and innovation. The aim of this project is to advance the start-of-the art and to lay a new foundation for dependable and adaptable cognitive systems that can plan, communicate and collaborate in complex and dynamic environments.

DP0773415 A/Prof N Zhang; Dr S Huang; Dr H Du

Approved Project Title **Demand Dependent Active Suspensions for Preventing Vehicle Rollover**

2007 : \$40,000

2008 : \$40,000

2009 : \$40,000

Primary RFCD 2904 AUTOMOTIVE ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Rollover crashes are a major public safety issue in Australia. Reliable and low cost anti-roll technology and the availability of required design methodology and simulation tools will greatly assist the automotive industry in improving vehicle safety and consequently enhance its competitiveness in the global marketplace. The knowledge acquired from this project would provide an essential theoretical basis for commercialising the proposed suspensions and enhance the exports of Australian car component manufacturers. It would also benefit aeronautical, military and other industries. The wide community would benefit by potentially reduced death rates and fatal injuries caused by rollover crashes, and through increased employment in industry.

DP0773858 Prof JG Zhu; Dr D Liu; Mr Y Guo

Approved Project Title **Application Oriented System Level Optimum Design Method for Advanced Electrical Drive Systems**

2007 : \$47,000

2008 : \$45,000

2009 : \$43,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

The new concept of application-oriented, integrated, system level design will relieve the constraints formerly applied to appliances by motors and give appliance designers full freedom to pursue the best appliance functions. The new platform will become a powerful tool for designing advanced drive systems of new materials, novel topologies, low cost and high performance, and shorten significantly the period of new product development. This will enhance tremendously the competitiveness of Australian industry. The energy savings achieved by using efficient systems will contribute significantly towards the reduction of greenhouse gas emission. High quality PhD and honours degree students will be trained.