



UNIVERSITY OF
TECHNOLOGY SYDNEY

Centre for Quantum Computation & Intelligent Systems

University of Technology, Sydney, Australia

Collaborative Partnerships
Delivering Innovation to
Government and Industry

UTS:QCS
QUANTUM COMPUTATION & INTELLIGENT SYSTEMS

Collaborative Partnerships with QCIS

The Opportunity

The 'Centre for Quantum Computation & Intelligent Systems' (QCIS) is one of the largest focussed research centres in Australia. The high quality of its publication track record has established it as a key research centre which is acknowledged by centres and laboratories worldwide. The QCIS Centre focuses on key areas of strategic importance. To give just five examples:

- advances in quantum computation are reshaping the agenda in computationally intensive areas including: data mining, encryption, and intelligent systems
- our recent advances in data mining are now being applied in capital market surveillance and compliance, and to crime analysis
- fundamental work on understanding cooperation and competition is being trialled and validated by our award-winning robot soccer team
- developments in e-service intelligence are delivering practical tools to support organisational decision-making and crisis prediction, and
- work on the visualisation of genes is assisting clinicians and biologists in cancer diagnosis and treatment.

By supporting the full range of research, from fundamental to applied, QCIS ensures that it remains agile as new practical challenges emerge. Is the intellectual property and technical know-how of the QCIS Centre of value to your organisation? If it is, then you have the opportunity to partner with us to both shape the future of your organisation and to build and extend QCIS to serve the future needs of Australia.

How can you take advantage of what we have to offer? This leaflet will give you some ideas. Better still, come and talk to us, and together we will map-out how we can work together.

What makes a collaborative partnership?

At QCIS we believe that collaborative partnerships have three essential ingredients:

- the collaboration must fully support the mission of each partner — the relationship must be a 'win-win';
- the collaboration should look beyond immediate deliverables to fostering the interests of a long-term partnership, and
- both parties should understand each other's opportunity constraints, and deliver commitments in a timely way.

Confidentiality

The intellectual property in collaborative research with QCIS is normally protected with a formal agreement. Intellectual property includes: ideas, algorithms, software, methods, know-how, data and strategic information. In a collaborative project intellectual property may be:

- generated by those working on the project, or
- generated or acquired by one or other of the collaborative partners outside the activities of the collaboration, possibly prior to the collaboration, and used in the collaboration.

In both cases, with QCIS the uncompromising respect of intellectual property is considered to be essential.

Deliverables and Commitments

A clear understanding at the beginning of a project of: who is responsible for tasks, what the deliverables are, and what is owned by each partner are vital to a healthy collaboration. At the beginning of a QCIS collaborative project we work with the University's Research and Innovation Office to clarify these matters in a formal contract. Framing these contracts is normally a routine matter, but is essential to ensure that expectations are met, before resources are applied.

Collaborative partnerships with QCIS

The key aim of many partnerships is to generate and deploy valuable intellectual property. Successful partnerships are more than just 'contract research' and typically involve at least some of the following activities:

Attend QCIS public events

The Centre for QCIS hosts regular public events including a regular seminar series. These are great ways to find out what is going on in the Centre and to get to know the researchers on a personal basis. We'd be delighted to put your name on our mailing list. We look forward to welcoming you.

Research Masters and PhD degrees

The central topic of research degrees in QCIS ranges from fundamental research to work with a strictly applied focus. Our research students, who typically study full-time for two or three years, are a vital part of our research effort. Their work forms a key part of most collaborative partnerships.

As an illustration, one way for an organisation to benefit from these degrees is to enrol a member of staff in a research program to work with QCIS on a topic of central importance to the organisation's mission. The individual must be capable of conducting a research investigation at a high level, and the topic must be within our expertise. As long as these are satisfied, the organisation gains a trained professional with senior consultancy skills, the individual gains a higher degree and QCIS profits from working with 'real' problems — a win-win for all. There are fees associated with these degrees, but there are competitive scholarships available, including Australian Postgraduate Awards which students may apply for prior to, or during, their studies.

Information on the support available for students in research degrees may be found on the DEST website: <http://www.dest.gov.au/>, and on the UTS site: <http://www.uts.edu.au/research/>

Australian Research Council (ARC)

The ARC supports research in Australia through a variety of programs. One of these is the Linkage Projects scheme which supports collaborative research and development projects between higher education organisations, and government and industry. Linkage Projects require a contribution from the industry partner which is typically exceeded by the contribution from the ARC, which in turn is in addition to the contribution from the University. This makes them most attractive to the collaborative partner. As the ARC is generally a major contributor to these projects, the IP developed is normally subject to a formal sharing arrangement.

Linkage Projects are competitive grants which are submitted through the university partner — the lead-time from framing the project to award of the grant can be twelve months or more. Given this delay, UTS has its 'UTS Partnership Grant Scheme', which provides seed funding to encourage and develop strategic research alliances between UTS researchers and research partners in industry and government. An organisation that is keen to establish a collaborative partnership may, in the early stages, consider some of the other options listed here.

Further information on the ARC's Linkage Projects, and other ARC initiatives, may be found on their website: <http://www.arc.gov.au/>, and on the UTS site: <http://www.uts.edu.au/research/>

Self-Funded Projects

The best way to start a collaboration promptly is to fund the major salary costs, at least directly. QCIS welcomes partners who have funds for a project, and to discussing ways in which the Centre can contribute resources, including the involvement of our researchers. We are also pleased to work with partners to apply for funding from competitive schemes such as the ARC Linkage Project scheme, and the Australian Postgraduate Awards scheme described above.

Consulting

QCIS researchers provide their time to collaborative partnerships as part of the Centre's contribution. They are also available as consultants in an individual capacity to give professional advice outside any collaborative arrangement.

Sponsorship and Donations

The strong profile of QCIS, coupled with its high visibility, make it an attractive proposition for sponsorship and donations that enable organisations to be publicly associated with the Centre. For example, cash sponsorship may be recognised with corporate branding by supporting major events, naming laboratories, establishing scholarships or creating prizes. Donations of software and equipment may be similarly acknowledged. If you wish to sponsor events, laboratories, scholarships or prizes, or if you are interested in making a donation to the Centre, we will be delighted to discuss these options with you.

Case Studies in Collaboration

Centrelink

This collaborative partnership commenced with two UTS Partnership grants and then progressed to an ARC Linkage Grant:

- 2005 – 2006. This collaborative partnership commenced with two pilot projects with the support of the University of Technology, Sydney and Centrelink through UTS Partnership grants
- 2007 – 2009. With the support of the Australian Research Council through a Linkage Grant this collaborative partnership is investigating “Data Mining of Activity Transactions to Strengthen Debt Prevention”

Alcatel-Lucent Bell Labs

Through Alcatel Australasia, the CSIS Knowledge Infrastructure Laboratory is proud of its long association with Alcatel-Lucent Bell Labs. This collaborative partnership has developed through three distinct phases:

- 2004 – 2005. The collaboration commenced with generous funding by Alcatel to explore the application of intelligent agent technology to the automated negotiation of service level agreements within the telecommunications network
- 2005 – 2007. With the support of the Australian Research Council through a Linkage Grant this collaborative partnership expanded to consider “Managing quality of experience delivery in new generation telecommunications networks with e-Negotiation”
- 2008 – 2011. With continued support from the ARC for a second Linkage Grant this collaborative partnership is now investigating “Smart communications network management: Delivering bundled interdependent services across internetworked heterogeneous domains”.

Westpac Banking Corporation

This collaborative partnership began with a UTS Partnership grant and then progressed to an ARC Linkage Grant:

- 2008. A pilot project was supported by the University of Technology, Sydney through its UTS Partnership Grants scheme
- 2009 – 2011. With the support of the Australian Research Council through a Linkage Grant this collaborative partnership is investigating “Pattern Analysis and Risk Control of E-Commerce Transactions to Secure Online Payments”

The Centre for Quantum Computation & Intelligent Systems

The Centre for Quantum Computation and Intelligent Systems (QCIS) is a new Research Centre within the University of Technology, Sydney's Priority Investment Research Program. The QCIS Centre's mission is to be acknowledged by research centres throughout the world as a pre-eminent research centre in quantum computation and intelligent systems, and to be acknowledged by Australian industry and government as a leading source of knowledge and expertise in quantum computation and intelligent systems.

The Centre for Quantum Computation and Intelligent Systems was established in April 2008 with a vision to develop:

- theoretical foundations for quantum computation,
- theoretical foundations for intelligent systems, and
- innovative technologies for intelligent systems.

This technology will result in next-generation enterprise intelligent information systems.

The Centre's five major research programs cover quantum computation, knowledge discovery, decision support, innovation, and infrastructure enhancement. Together, these programs develop a set of innovative and practical methodologies and techniques for intelligent information processing and system building for a broad range of businesses in the finance, marketing, security, health, telecommunications, government and engineering sectors.

The five QCIS state-of-the-art research laboratories, listed in alphabetical order, are:

- Data Sciences and Knowledge Discovery Laboratory
- Decision Systems and e-Service Intelligence Laboratory
- Innovation and Enterprise Research Laboratory
- Knowledge Infrastructure Laboratory
- Quantum Computation Laboratory

The Centre is staffed by over twenty scientists and more than forty research students. It is located in The University of Technology, Sydney, Building 10, on Jones Street at Broadway (Sydney). For more information, contact QCIS at UTS on (02) 9514 2000, by email at: qcis-centre@it.uts.edu.au, or visit the QCIS website at: www.qcis.uts.edu.au.

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