



Guido Governatori
SSRG Research Leader

From imagination to impact

**Research Excellence in ICT
Wealth Creation for Australia**



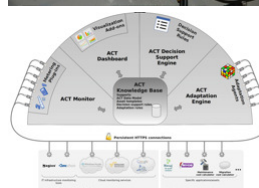
Australian Government
Department of Broadband, Communications
and the Digital Economy
Australian Research Council

NICTA Funding and Supporting Members and Partners

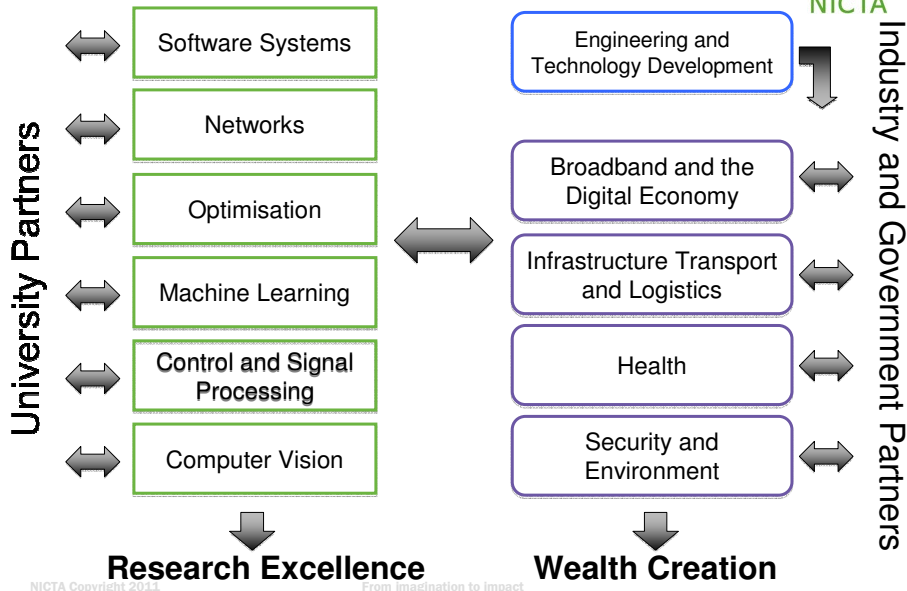


NICTA in Brief

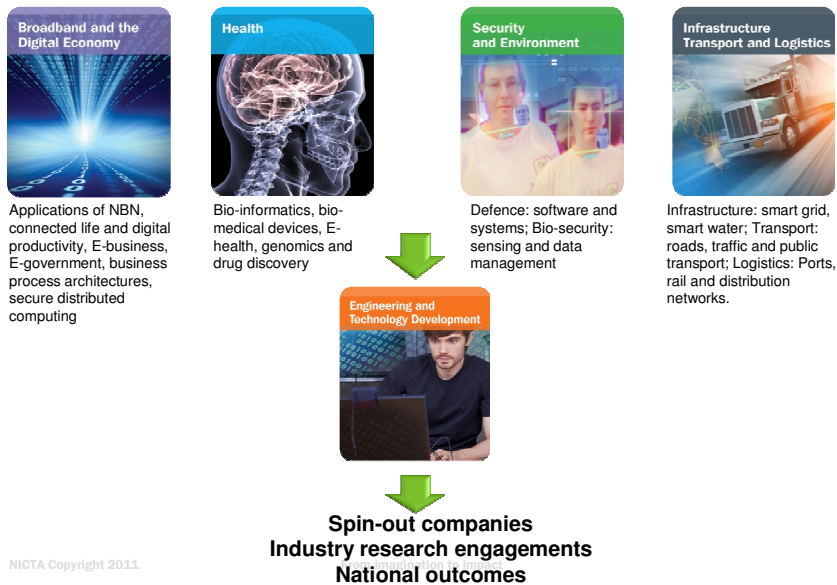
- Australia's National Centre of Excellence in Information and Communication Technology
- Five Research Labs:
 - ATP: Australian Technology Park, Sydney
 - NRL: UNSW, Sydney
 - CRL: ANU, Canberra
 - VRL: Uni. Melbourne
 - QRL: Uni. Queensland and QUT
- 700 staff including 270 PhD students
- Budget: ~\$90m/yr from Fed/State Gov and industry
- ~600 research papers/year, ~150 patents total



NICTA: Research and Outcomes



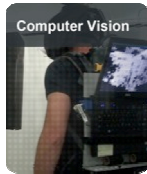
NICTA Business Teams



NICTA Research Groups



Software Systems
Achieving fundamental, game-changing improvements in the design, implementation, and verification of software systems



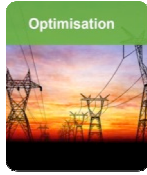
Computer Vision
Understanding the world using images and image sequences



Networks
Developing mechanisms to improve the experience of users when accessing online information and services, including wireless networks



Machine Learning
Making sense of the ever increasing amounts of data available around the world



Optimisation
Using scientific results to model any organisation or system, simulate and optimise it



Control and Signal Processing
Real-time control of large distributed dynamic systems such as power grids, water, transport and security networks

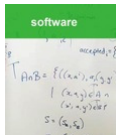


**Top tier publications and conferences
International recognition**

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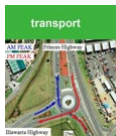
From Imagination to Impact

NICTA Outcomes



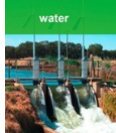
Security software: formal verification technology (NSW)

- World-leading 'crash-proof' software (sel4 microkernel)
- International recognition for this research (MIT listed it in their 'top 10' technologies for 2011)



Transport (NSW & ACT)

- South of Wollongong roundabout (early simulation modelling shows total trip times for traffic are 5% faster)
- Australia's first 'Living Lab' (a unique 'hands-on' demonstration space for industry and researchers)



Water (Farmnet - VIC)

- In dairy, achieved a 38% improvement in gross margin
- In horticulture (apple orchard), achieved a 73% increase in gross return (AU\$/hectare)



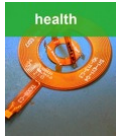
Logistics (NSW, ACT)

- Reduced costs for major bread company route by 7-8% which effectively doubled profit margin for company

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NICTA Outcomes



health

Health (NSW, ACT, VIC & QLD)

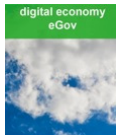
- Developed world-leading technology – Bionic Eye
- Medical implants to manage chronic pain
- Technology developed for 'drug design' that is several times faster and more accurate than world best practice



financial services

Financial Services (NSW)

- Ground-breaking work with banking industry to standardise mortgage applications: savings of \$50M-\$100M per year



digital economy

eGov

Digital Economy and eGov (ACT & NSW, QLD)

- Technology to test new large IT systems before roll-out (ATO)
- New cloud-computing disaster recovery technology
- Emergency communications standard adopted around world

Normative Systems



- Formal Models of Normative Reasoning

Balance between conceptually sound normative models (grounded in current legal theory and legal practice) and computationally oriented approach.

Models of norm change including abrogation, annulment considering retroactivity.

Normative Systems



- Regulatory Compliance

To ensure that business processes of organisations are aligned with relevant normative framework

First comprehensive, industry scale model and prototype. Carried out trial with Telecommunication Industry in Australia. Reduction of 40% of time needed to implement compliance initiatives

Normative Systems



- Legal Drafting and Impact of New Norms

Developing methodology to study the impact of changes in legislations.

Work with state government to reduce the cost of drafting new pieces of legislation, evaluate the impact of the new norms. Aiming at reducing red tape by 20%.