

# Centre for Defence Communications and Information Networking

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## RELIABLE, INDEPENDENT, LEADING EDGE DEFENCE NETWORK CAPABILITY

ROBUSTNESS | RELIABILITY | EFFICIENCY | SECURITY

The Centre for Defence Communications and Information Networking (CDCIN) at the University of Adelaide is Australia's leading university based concentration of defence network analysis capability.

CDCIN focusses on the modelling, measurement and management of networked systems, enhancing the robustness, efficiency and effectiveness of existing and future networks.

Combining outstanding expertise with a focus on delivering outcomes to our partners, CDCIN is a unique and proven source of independent, leading edge analysis and advice on network design, technology and operations.

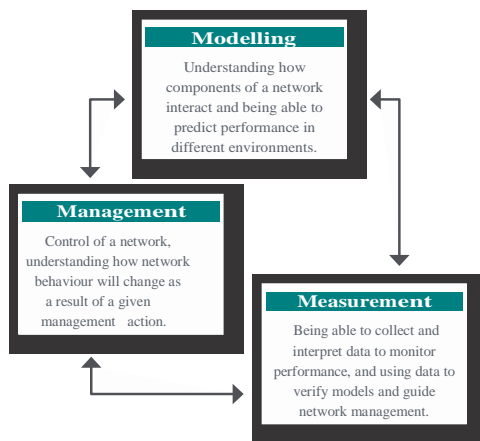


## OUR APPROACH

Our successes are enabled not just by our fundamental technical skills, but by our understanding of the importance of prediction, verification and action in making networks work.

This understanding of modelling, measurement and management provides a sound quantitative basis for delivering consistent and on-going improvement in network design and operation.

To be effective, technical excellence must be supplemented with operational experience – experience that strikes the balance between technical purity and the needs of our partners.



## OUR SUCCESS STORIES

- Analysing measurements of operational networks, identifying operational savings opportunities of millions of dollars per year, and developing the systems to achieve those savings at over a 40 to 1 return on investment.
- Developing tools that enable the realistic modelling of both current and future Tactical Data Information Link (TADIL) technologies and the prediction of Quality of Service in both link and networked environments.
- Analysing proposed Maritime Tactical Wide Area Network architectures, network configurations and prioritization of application traffic and supplying recommendations resulting in a more robust and efficient network design.
- Developing new mathematical techniques for inferring the number of users transmitting data in encrypted wireless access systems such as Wi-Fi (802.11x), and using this insight to develop new ways to “hide” when information is being transmitted, while minimally impacting on system performance.
- Inventing new techniques for analysing network traffic measurements, techniques that enable better network engineering and identification of when and where to expand capacity.
- Undertaking ground breaking research that provides a mathematically provable method for identifying where oscillations in network routing might occur and identifying how to remove such oscillations, thereby enabling network configurations to be tested and debugged before deployment.

- Developing new experimental platforms that not only predict network performance, but enable cost effective human and system in the loop experimentation.

## SERVICES

- Network analysis
- Capacity planning
- Quality of Service prediction
- Network management
- Monitoring and measurement analysis
- Protocol design and analysis
- Consulting
- Training and education

## CLIENTS

- Defence Science and Technology Organisation (DSTO)
- Defence Materiel Organisation
- Lockheed Martin
- BAE Systems Australia
- Cisco
- ASC
- Qinetiq
- Defence SA

## FOR MORE INFORMATION

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## OUR TEAM

Our ability to provide the highest quality science and technology advice comes directly from the quality and experience of our people. Our expertise has been developed in leading research and development organisations worldwide, providing a combined experience of over 150 years in all aspects of network design, analysis, and management. Key members of our team are:

- DR MICHAEL WEBB**, Principal Defence Analyst, with 20 years experience at the Defence Science and Technology Organisation (DSTO). While at DSTO he was Head of the Distributed Enterprises Group of the Command and Control Division; Team Leader for the multi-divisional team undertaking a comprehensive evaluation of the communications and information systems support for command and control within the Middle-East Area of Operations; Secretariat of the 4CI Thematic Working Group in National Security; and Head of the Distributed Enterprises Discipline of the C3I Division. Michael leads CDCIN’s Defence Networking R&D Program.

- DR BRUCE NORTHCOTE**, Principal Analyst, with over 20 years of experience in telecommunications, including Bellcore / Telcordia (USA), Fujitsu (USA), leading international standardization efforts and R&D focused on improved network capacity management in third generation wireless networks.
- DR ANDREW COYLE**, Principal Analyst, with over 20 years of experience in network analysis and operations research, leading research in network performance analysis and experimentation. His work has included design and analysis of IP core networks, modeling and simulation of wireless ad hoc networks and developing novel algorithms “hiding” traffic in the open. Andrew leads CDCIN’s experimental research program in Mobile Ad Hoc Networking.
- DR SANJEEVAN NAGULESWARAN**, Senior Research Fellow, with over 15 years of post-PhD experience in industry and academia. He has worked as a Senior Research Engineer and team leader in the areas of Signal Processing, Satellite

Communications, Information Theory and Narrow Band Multi User Detection Techniques.

- DR MATTHEW BRITTON**, Senior Analyst; with over 16 years of experience in the telecommunications industry, entrepreneurship and academia, including the Defence Science and Technology Organisation (DSTO), University College London (UCL) and Senceive in the UK. At DSTO he worked on communication protocols, architectural design and operational effectiveness. At University College London (UCL) Matthew worked on mobile cellular and wireless sensor networks. He founded and managed Senceive based on his UCL research and development, developing industrial monitoring products and services
- ASSOC PROF MATTHEW ROUGHAN**, with over 20 years of experience in telecommunications, including AT&T Labs (USA), University of Melbourne and University of Adelaide, undertaking research focused on advanced traffic analysis techniques and improving network operations and routing.