



ARC Communications Research Network

# Newsletter December 2008

## Report from the Board

I would firstly like to take the opportunity to record the Board's appreciation and thanks to Professor Lars Rasmussen who conducted the role of Network Convener with sensitivity and efficiency. Lars' contribution to the communications research community in Australia is significant, and we all wish him well in his new position.

Professor Alex Grant will replace Lars as convener and an executive assistant from UniSA will be appointed to aid Alex in this role.

The board would also like to thank Dr Belinda Chiera who was the ACoRN local representative at the University of Adelaide.

I will take over editorial responsibility for the newsletter.

As this newsletter indicates, we have recently had a number of very successful events and the Board records its appreciation to all involved in organising these events and to all attendees.

There have been a number of requests seeking funding from central ACoRN funds. The Board would like to reiterate that it applies a consistent policy of not funding conference attendances from

these funds, unless part of a sponsorship package which includes such support. Central funds are allocated to those proposals which can be expected to develop collaborative research relationships which align with key ACoRN objectives. Such proposals may contain requests for conference related expenses but conference attendance can not be the main objective of the proposal.

Another major event which has almost been completed is the admission of Macquarie university to the network. We welcome their involvement and look forward to their active participation in all aspects of ACoRN's programmes. The local representative is Professor Tony Parker.

Another piece of good news is that through the strong representations made by Professor Abbas Jamalipour, the IEEE Wireless Communications and Networking Conference will be held in Sydney in 2010.

Finally, thanks to all ACoRN staff, researchers, local reps and participants for your hard work and dedication, the Board wishes you well for the festive season and 2009.

Lang White  
(Board Member)

## ACoRN Workshop Reports

### OFDM Workshop

#### Melbourne - November 17<sup>th</sup> - 18<sup>th</sup>

The first day started with an introduction to OFDM given by Brian Krongold (UniMelb), followed by talks from Andrew Zhang (NICTA), Matt Ruan (NICTA), and Dhammika Jayalath (Queensland University of Technology) on the finer details of OFDM system. With over 30 attendees, and interaction between the audience and the speakers, it was a very informative day. The second day dealt with more advanced topics in OFDM and featured speakers from both academia and industry: Satha K. Sathanathan (NEC Australia), Jamie Evans (UniMelb), Bill Shieh (UniMelb), Andrew Zhang (NICTA), Dominic Yip (NICTA), and Jeff Li (NICTA).

### MeISA Information Theory retreat

#### Lorne – November 24<sup>th</sup> – 28<sup>th</sup>

The retreat was attended by thirteen researchers from the University of South Australia and the University of Melbourne, as well as two doctoral candidates from Macquarie University and Princeton.

The retreat commenced with presentations of a number of open problems and possible avenues of research. From these presentations, three main technical problems were studied in detail. The first problem concerned the application of information theoretic ideas to compressed sensing; the second problem concerned the capacity of certain quantized channels; and the third problem concerned converses in multiterminal information theory. Work on each of these problems is ongoing, and preliminary results will be presented at AusCTW 2009.

The contributions and ideas of all those who attended the retreat are appreciated.



### Network Coding, Error Correction & Security School

#### Adelaide – December 1<sup>st</sup> & 2<sup>nd</sup>

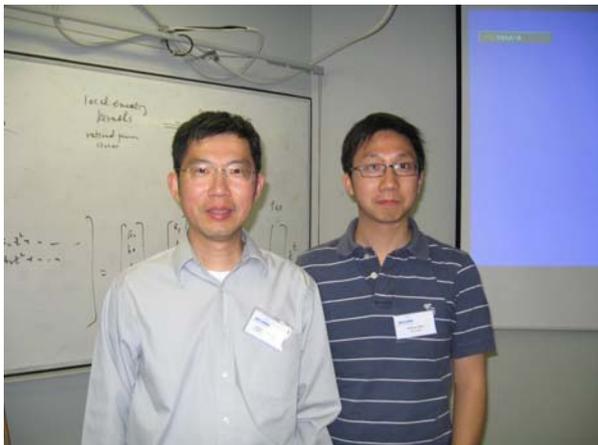
The main objective of this school was to introduce the targeted audience to the current state-of-the-art research in relevant areas. This short course was presented by Prof Raymond Yeung and Dr Terence Chan. Prof Yeung from The Chinese University of Hong Kong. Prof Yeung is a world-renowned information theorist and was one of the pioneers in the area of network coding. Together with Prof R. Li and Prof N. Cai, his work on linear network coding was awarded the 2005 IEEE Information Theory Society Best Paper Award. Dr Chan is from Institute for Telecommunications Research at University of South Australia. He is one of the most active information theorists in Australia and has made fundamental contributions to information theory, applied to communications networks.

The first day of the school covered the basic theory and recent results in network coding. It began with the single source multicast. Linear networks codes were introduced next and its optimality was proved. Afterwards, deterministic and random code constructions were proposed. Results were also extended to network with cycles.

In the second half of the day, network coding in multi-sources scenarios was addressed. Bounds on achievable rate-capacity tuples were given. Recent duality results on the relation between achievable tuples and entropy functions were also presented.

On the second day, the focuses were shifted to the secrecy and robustness aspects of communications in networks, subject to the presence of eavesdroppers and malicious adversaries. Frameworks for designing network error correcting codes for networks with known or unknown topologies were introduced. Finally, transmission schemes that protect against information leakage were given.

This Network Coding School was a great success where attendees were researchers and students from around the world. It has raised interests of attendees and enhanced research activities in the area of network coding in Australia.



Prof Raymond Yeung and Dr Terence Chan.

## ACoRN-NEWCOM Workshop Adelaide – December 3<sup>rd</sup> & 4<sup>th</sup>

After a successful workshop last year, ACoRN held its second Australian-European workshop, organized by Dr. Ingmar Land, Dr. Gottfried Lechner, and Professor Lars K. Rasmussen. The workshop lasted two days, and there were interesting presentations and lively discussions. Besides eleven Australian participants, we have been able to host Alexandre Graell i Amat from France, Maxime Guillaud from Austria, Eirik Rosnes from Norway, and Christian Koller from USA.

Following last years tradition, the number of participants was restricted, resulting in lots of fruitful discussions during the presentations as well as during the breaks.



## ACoRN News

### Farewell for Lars

We were all very sad to farewell Prof. Rasmussen. Lars has had a huge impact on the Australian Communications Research Community. His biggest achievement is arguably the ARC Communications Research Network (ACoRN). Many hundreds of researchers have benefited from the ability to meet with other researchers, which would not have been possible without the finances and network that ACoRN has provided. Many international researchers have been able to visit Australia to the benefit of the Australian research Community.



We Wish Lars every success in the new role at the Royal Institute of Technology, in Sweden and thank him for his contribution to Australian Research.



In true Aussie style we served prawns from the Barbie.

### NEWCOM+++ - ACoRN Workshop

The European Network of Excellence in Wireless Communications NEWCOM++ and the Australian Communications Research Network (ACoRN) are organizing a joint workshop in Barcelona, Spain on March 30-April 1, 2009.

All NEWCOM++, ACoRN and COST2100 researchers are encouraged to make plans and attend this important workshop, which is also open to external attendees. This event will include tutorials by world experts on important topics (the first day), industry-academia interaction via a dissemination day (the second day) and a scientific-presentations forum the third day, for which the CFP applies.

NEWCOM++, ACoRN and COST2100 researchers are invited and strongly encouraged to submit papers for the forum of the third day, as this represents a unique opportunity to highlight important research achievements of these networks.

ACoRN grants are available for this workshop.

<http://www.newcom-acorn.org/naw09>

## OPPORTUNITIES

### Institute for Telecommunications Research

Open Position: Channel Coding and Network Coding for Cooperative Communications

- 2 year fixed term contract (renewable subject to funding)
- Mawson Lakes Campus
- Total Remuneration package \$74K - \$105K

The Institute for Telecommunications Research (ITR) is Australia's largest University-based telecommunications technology research organization, and is internationally recognised for excellence in the areas of information theory, error control coding, mobile broadband, cellular, wireless and satellite communications. ITR is home to a broad range of research activities, from basic theory and commercially funded applied projects, right through to development of high-quality software and hardware products for industry.

Applications are invited for the position of Research Fellow/Senior Research Fellow. The successful candidate will conduct fundamental research, contributing to the ARC Discovery Project, *Efficient Transmission Strategies for Cooperative Wireless Ad Hoc Networks*. The project focuses on the innovative use of channel and network coding techniques to increase reliability, throughput, and coverage of cooperative wireless ad hoc networks. The main task is to devise new transmission strategies for application within a cooperative wireless network of arbitrary size and topology with an emphasis on efficiency, simplicity, and scalability to allow for practical implementation.

The project is in collaboration with researchers at the Royal Institute of Technology (Stockholm, Sweden) and University of Erlangen-Nürnberg (Erlangen, Germany).

Applications close: Sunday 4th January 2009

**For further detail on any of these opportunities, please contact Dr. Ingmar Land on: +61 8 8302 3868 or email: [Ingmar.Land@unisa.edu.au](mailto:Ingmar.Land@unisa.edu.au) or visit: <http://www.itr.unisa.edu.au/> and [www.unisa.edu.au/hrm/careers](http://www.unisa.edu.au/hrm/careers)**

## Institute for Telecommunications Research

Open Position: Coding for Fading Channels

- 2 year fixed term contract (renewable subject to funding)
- Mawson Lakes Campus
- Total Remuneration package \$74K - \$105K

The Institute for Telecommunications Research (ITR) is Australia's largest University-based telecommunications technology research organization, and is internationally recognised for excellence in the areas of information theory, error control coding, mobile broadband, cellular, wireless and satellite communications. ITR is home to a broad range of research activities, from basic theory and commercially funded applied projects, right through to development of high-quality software and hardware products for industry.

Applications are invited for the position of Research Fellow/Senior Research Fellow. The successful candidate will conduct fundamental research, contributing to the ARC Discovery Project, *Adaptive Broadband Wireless Communications*. The project focuses on fundamental limits and optimal transmission strategies for delay-limited block-fading channels. The aim is to optimize reliability/throughput tradeoffs by adopting adaptive transmission strategies. The expected outcomes are a theoretical design framework, and new practical designs for future broadband wireless applications.

The project is in collaboration with researchers at the Royal Institute of Technology (Stockholm, Sweden) and University of Cambridge (Cambridge, UK).

Applications close: Sunday 4th January 2009

For further detail on any of these opportunities, please contact Prof. Alex Grant on: +61 8 8302 5219 or email: [Alex.Grant@unisa.edu.au](mailto:Alex.Grant@unisa.edu.au) or visit:

[www.unisa.edu.au/hrm/careers](http://www.unisa.edu.au/hrm/careers)



## Institute for Telecommunications Research

### Research Engineer

- Institute for Telecommunications Research
- 12 month fixed term contract
- Total remuneration package \$67K - \$75K

The Institute for Telecommunications Research (ITR) is Australia's largest University-based telecommunications technology research organisation, and is internationally recognised for excellence in the areas of information theory, error control coding, mobile broadband, cellular, wireless and satellite communications. ITR is home to a broad range of research activities, from basic theory and commercially funded applied projects, right through to development of high-quality software and hardware products for industry. The South Australian Networking Laboratory (SANLab) is a partnership between ITR, the Centre for Defence Communications and Information Networks at the University of Adelaide, and industry partners. SANLab will provide experimentation facilities and research expertise for the development of mobile ad hoc networks.

Applications are invited for the position of SANLab Research Engineer. The successful candidate will undertake tasks in setting up a software defined radio development platform, establishing baseline implementations for a number of wireless standards, facilitating implementation and investigation of novel transceiver algorithms and architectures for physical and cross-layer optimisation, and participating in field trials. We seek an engineer with hardware platform development and/or system simulation experience.

Applications close: Sunday 11th January 2009

For further detail on any of these opportunities, please contact

Associate Professor Linda Davis on: +61 8 8302 5237 or email: [linda.davis@unisa.edu.au](mailto:linda.davis@unisa.edu.au) or visit:

[www.unisa.edu.au/hrm/careers](http://www.unisa.edu.au/hrm/careers)



## Coleman Postdoctoral Fellowship

Applications are invited for two-year postdoctoral positions beginning July 1, 2009. The position will involve teaching two one-semester courses per year. Salary will be commensurate with rank and qualifications.

The candidate's research should be in one of the existing areas of strength of the Department.

These include algebraic geometry, coding theory, control theory, dynamical systems, free probability, information theory, invariant theory, mathematical biology, mathematical physics, number theory, representation theory, and theoretical and applied statistics.

Further details on the departmental research profile can be found at the department's web page

<http://www.mast.queensu.ca/graduate/faculty.php>

Applications should be submitted at [www.MathJobs.org](http://www.MathJobs.org). The application file should contain: Cover letter, CV, AMS cover sheet (template is provided at [www.MathJobs.org](http://www.MathJobs.org)), Research Statement, Teaching Statement, and four recommendation letters at least one of which addresses teaching. The recommendation letters may be submitted electronically (this is the preferred method), or sent as a hard copy to:

Coleman Postdoctoral Committee  
Department of Mathematics and Statistics  
Queen's University  
Kingston, Ontario  
Canada, K7L 3N6.

We invite applications from all qualified individuals.

Queen's University is committed to employment equity and diversity in the workplace and welcomes applications from women, visible minorities, aboriginal people, persons with disabilities, and persons of any sexual orientation or gender identity.

All applications received by January 10th will be given full consideration.



## Coming Events

Event Date	Event
4-7 Jan 09	IEEE 2009 DSP & SPE Workshop- Marco Island Florida <a href="http://www.2009dsp.org/papers">http://www.2009dsp.org/papers</a>
6-8 Jan 09	2009 International Conference on Communications and Mobile Computing (CMC 2009) – China <a href="http://world-research-institutes.org/conferences/CSIE/2009">http://world-research-institutes.org/conferences/CSIE/2009</a>
4-6 Feb 09	AusCTW 2009 <a href="http://www.ee.unse.edu.au/ausctw2009">http://www.ee.unse.edu.au/ausctw2009</a>
20 Feb 09	6 <sup>th</sup> Annual Summer Systems & Control Workshop <a href="Http://scrg.ee.unse.edu.au">Http://scrg.ee.unse.edu.au</a>
30 Mar-2 Apr 09	NEWCOM+ + ACoRN workshop – Barcelona <a href="http://www.newcom-acorn.org/naw09">http://www.newcom-acorn.org/naw09</a>
31 Mar -2 Apr 09	CSIE 2009 – Las Angeles <a href="http://world-research-institutes.org/conferences/CSIE/2009">http://world-research-institutes.org/conferences/CSIE/2009</a>
11-16 Oct 09	ITW 2009 – Taormina, Sicily <a href="http://www.deis.unical.it/itw2009">http://www.deis.unical.it/itw2009</a>

For a complete list of coming events and call for papers, see the [event calendar](http://www.acorn.net.au/events/)  
<http://www.acorn.net.au/events/> .

