ARC Communications Research Network

Newsletter May 2007

Convenors Report

The first part of the year has seen a high level of ACoRN-grant-approval activities. Most of the ACoRN university partners have now realised the opportunities provided by ACoRN, and as a consequence the spending rate has increased as compared to the start of the previous two years. From my point-of-view, as the Network Convenor, this is a very gratifying development, and I am very pleased that ACoRN is now moving strongly towards realising its full potential. Keep it up ACoRN members!!

In July we have two exciting ACoRN workshops on offer, both focusing on cooperative multihop networks from two different perspectives. July 9-10, the two-day ACoRN Workshop on Cooperative Wireless Communications is held at the University of New South Wales, organised by A/Prof. Jinhong Yuan (UNSW) and Dr. Yonghui Li (Uni Sydney). This workshop mainly brings together the physical-layer researchers in ACoRN, working on transmission strategies for cooperative multi-terminal networks.

The following week, July 16-17, the two-day ACoRN Workshop on Multihop Wireless Networking is held at ITR, University of South Australia, organised by Dr. Aruna Jayasuriya and Dr. Qiang Fu (UniSA), Dr. Lavy Libman (NICTA), Dr. John Papandriopoulos (Uni. Melbourne), and Dr. Bjorn Landfeldt (Uni. Sydney and NICTA). This workshop mainly brings together the network-layer researchers in ACoRN working on protocols and

control of multihop networks. In the spirit of cross-disciplinary research, which is a high priority of ACoRN, we are already now looking into the possibility of having a joint physical-layer/network-layer workshop on cooperative multihop wireless networks next year.

To encourage new initiatives within our community, the ACoRN Executive Board has this year approved a new budget item, dedicating central funds for directly supporting activities of high priority, i.e., no matching funding required. As an example of initiatives supported from these funds, internationally recognised experts have been invited to take part in the two upcoming ACoRN workshops on cooperative multihop networks. Future ACoRN workshop and school events will also be encouraged to invite international experts, funded directly by ACoRN central funds. In general ACoRN members are encouraged to push forward new initiatives for promoting research excellence within our ACoRN community. Financial and administrative support for all such initiatives will be considered by the ACoRN Executive Board. Please contact the ACoRN Administrator, Christine Thursby, for further information.

As a heads-up for ACoRN activities already scheduled for this year, get yourselves ready for the ACoRN Workshop on Signal Processing for Optical Communications Systems organised by Prof. Jean Armstrong (Monash Uni), and the ACoRN School on OFDM and MIMO Technologies organised by

Dr. Brian Krongold (Uni. Melbourne). As soon as the dates have been finalised, we will broadcast the details for these exciting, upcoming events. A big thank-you from the ACoRN community goes to both Jean and Brian for taking the time to organise these events.

From the beginning of ACoRN it has been a priority to support longer-term research visits by our top students, making sure they have the best opportunities to excel into research excellence. It has been a slow start getting the student mobility program embraced by the ACoRN partner universities. This year, however, I am pleased to report that the level of activity is increasing. So far we have approved four research visits of six weeks or longer by top students. Xia Li (Monash University) will be visiting the Heinrich-Hertz Institute in Berlin and University of California at Santa Clara for a total of 8 weeks. Ashley Flavel (Uni. Adelaide) has been offered an internship at AT&T in New Jersey for a total of 12 weeks. Raymond Louie (Uni. Sydney) will visit ETH, Zurich and the Hong Kong University of Science and Technology for a total of 7 weeks. Khoa Nguyen (UniSA) will visit University of Cambridge for a total of 9 weeks.

Good luck to all our workshop and school organisers and our student travellers.

Lars K. Rasmussen

ACoRN Network Convenor

News

NOVA

One of the Strategic Objectives of ACoRN is to nurture the careers of Young Investigators and research students, promoting a sense of community, collaboration and a culture of effective mentoring. ACoRN has sponsored a topic through NOVA which is under the umbrella of the Australian Academy of Science. NOVA is aimed at Australian secondary teachers, students, parents, librarians, journalists and the general public with the aim of exciting students and to attract them to study science and technology. NOVA have tried to match the areas of research covered by ACoRN with the curriculum used in our schools. After much discussion, it was decided that the area of most benefit to school students would be wireless technology. Our sponsored topic is Wireless but not Clueless. We believe that this topic will be a popular topic for use in schools and also with the general public.

If you haven't yet visited the NOVA site please do so.

http://www.science.org.au/nova/097/097key.htm

ACoRN Visitors list

There is now an ACoRN Potential visitors list on the ACoRN web site for researchers wishing to spend some time researching at an Australian organisation.

The process is simple. The researcher forwards their contact details, CV and proposed dates of the visit to ACoRN. The details are displayed on the ACoRN website and the newsletter. Any organisation wishing to host the visitor contacts the visitor and makes arrangements.

If you have been contacted by a researcher, but your organisation has not been able to host the visit, send the details to

http://www.acorn.net.au/contact

News from the University of Queensland

The University of Queensland is Queensland's oldest university, established in 1909. In 1927, a bequest by the Maynes enabled the university to acquire 274 acres in St. Lucia. The university began to relocate in 1937 but WWII intervened. During the war, the university's iconic Forgan Smith building was appropriated as Advanced Land Headquarters by Gen. Sir Thomas Blamey. The university's relocation to St. Lucia was not complete until 1972. In 1990 & 1999, UQ incorporated new campuses at Gatton and Ipswich.

UQ's involvement in ACoRN began with ACoRN's establishment in 2004. The School of Information Technology & Electrical Engineering (ITEE) and the School of Physical Sciences contribute to ACoRN.

The School of ITEE

The School of ITEE has a long tradition of research in telecommunications. In particular, there is a strong & continuous tradition of excellence in microwave and photonics research beginning in the 1970s. This research has fostered many careers and spin-off companies.

In the School of ITEE, the academic and research staff contributing to ACoRN are:

Prof. Marek Bialkowski. His general area of research is microwave communications. In the past, he made considerable contributions to the field of switched beam and phased array antennas for mobile satellite communications which earned him IEEE Fellow award in 2002. His recent research activities concern the development of various multiple element antenna systems for wireless communications. These include prototypes of wideband smart antennas and narrow and wideband MIMO testbeds. Also he is involved with designing and development of ultra wideband components. At present, he is an adviser to 6 PhD students, three of them being ACoRN members. His former PhD students and ACoRN members, Salman Durrani, Monthippa Uthansakul, Peerapong Uthansakul and Amin Al'Kabi were recipients of best student paper presentation awards at national and international conferences, where their attendance was supported by ACoRN.

Dr. Vaughan Clarkson. His interests in telecommunications are in the fields of MIMO systems, DSL, OFDM and information & coding theory. He is the current ACoRN local representative for UQ. He is a Ph.D. advisor for ACoRN members Mandar Gujrathi, Robby McKilliam and (as associate to Iain Collings at The University of Sydney) Daniel Ryan.

Dr. Amin Abbosh. A member of the electromagnetic imaging research group at ITEE. He is involved in building ultra wideband devices for wireless communication systems. Many novel antennas (directive and omnidirectional), power dividers, directional couplers, hybrids, and correlators have been designed and built . Some of these devices are to be used to build microwave imgaing system for breast cancer detection. Others are to be used in next generation of hand-held devices and fixed base stations. He is also working with other members of the research group to build an online mutiple-input multiple-output testbed to investigate the feasability of some new coding and modulation techniques for high data rate systems.

Dr. Shantanu Padhi. His main research areas are in RF/Microwave communications. His current research activities includes, design and development of low profile antenna system for UWB communication system, fractal antenna for RFID, Flexible RFID, Organic electronics (security features), time domain near-field and far-field antenna measurements, resonance based target identification, tumor detection and microwave imaging.

Dr. Marius Portmann. His general research interests are computer communications, peer-to-peer systems and information security. His current research focus are wireless mesh networks for public safety and emergency response applications, specifically routing protocols for hybrid multi-radio mesh networks. This work is done in collaboration with NICTA.

Dr Aleksandar Rakic. His research interests are in design of optical interconnections for digital communications based on arrays of Vertical-Cavity Surface-Emitting Lasers, automated techniques for optical & RF characterisation of Vertical-Cavity Surface-Emitting Lasers (VCSELs) & 2D VCSEL Arrays and the design and modelling of Organic Microcavity Light Emitting Diodes.

ACoRN Member Profile

Raphael Cendrillon, late of UQ/ACoRN, now with Marvell in Hong Kong.

Raphael Cendrillon and Matt McKay (both lately of ACoRN, now HK ex-pats) enjoy a drink ahead of the World Cup Cricket day/night final.

At the beginning of 2005 I left the University of Queensland to take up a position in industry working on what essentially was the commercialization of the work I did during my PhD. This was an extremely exciting opportunity, but also meant I'd be relocating to Hong Kong, a place I'd never been and knew only through stories from friends who'd been here and thoroughly enjoyed themselves.

So in February 2006 I touched down in Hong Kong, expecting something like Bangkok but noisier, more crowded and more polluted. I was actually amazed to find that Hong Kong is an incredibly clean, beautiful city. So far it's been a fantastic place to live and has an amazing, vibrant life. But given that this is the ACoRN newsletter, perhaps I'd better get back to the engineering side of things :)

I'm currently working for Marvell, and develop signal processing techniques, specifically those related to MIMO and multi-user communications, for DSL and 3G/4G applications. Marvell is a chipset vendor, which essentially started as a

family business in 1995. The company has grown a lot since then, and now has 6000+ employees, although it still has a family feel. In fact the Chief Operating Officer is married to the CEO, and the Chief Technical Officer is the CEO's brother.

Marvell has had a number of big success stories of late. Their HDD chips drive the Ipod, their wireless chips are found inside the Playstation 3, PSP and Nikon cameras, and they recently acquired a large arm of Intel which develops the X-scale processor, an application processor found in a broad range of next generation PDA and smart phones including the Blackberry. One nice offshoot of this is that we all got PSPs and Nikon cameras for Christmas :)

So far the work here has been really interesting, there is a lot of opportunity to come up with creative ideas and interact with people who have a broad range of experience and diverse backgrounds. I'd definitely recommend Marvell to anyone looking for a dynamic, exciting place to work and who has an interest in communications and signal processing.

ACoRN Workshops

ACoRN Workshop on Co-operative Wireless Communications
Sydney 9-10 July 2007

Cooperative communications systems improve the capacity and transmission reliability of wireless transmissions by allowing cooperation between nodes or multi-user terminals. The research in this area has recently attracted a significant attention and has become one of most important research directions in wireless communications.

The First ACoRN Workshop on Cooperative Wireless Communications will be held in University of New South Wales, Sydney, on 9-10 July 2007. The 2-day workshop will consist of technique presentations and a poster session. The Workshop will also include invited plenary presentations.

ACoRN Multihop Wireless Networking Workshop
Adelaide 16-17 July 2007

Following the success of the first such workshop last year in Sydney, which was aimed at early career researchers, the ACoRN Workshop on Wireless Multihop Networks this year provides a forum for all researchers in Australia (including postgraduate students) working on these areas to present and discuss their current research directions, identify peers working on similar topics, and facilitate the process of establishing successful collaborations. The workshop will feature:

o   a keynote talk by Prof. Songwu Lu from the University of California in Los Angeles (UCLA);

o   a single track of presentations, with significant time after each presentation for questions, discussions, and uncovering any similarities with other ongoing works;

o   a special session on Underwater and Acoustic Networks and a poster session

ACoRN workshop on signal processing for optical communications systems

In September ACoRN will run a workshop on signal processing for optical communications systems. The workshop will be run by Professor Jean Armstrong from Monash University. Further details will be available soon.

ACoRN News

Adelaide University

Ashley Flavel will be presenting the paper "Modeling BGP Table Fluctuations" at the International Teletraffic Conference in Ottawa (June 17-21), followed by a 3 month internship at AT&T Labs (New Jersey) where he will be working on the broad issue of detecting anomalies in routing data such as misbehaving peers.

Melissa Liew will be travelling to Paris to work with Professor Eric Moulines at Ecole Nationale Supérieure des Télécommunications (ENST) and Professor Lang White (currently on sabbatical), to research applications on the modelling and optimisation of telecommunications networks.

Belinda Chiera has just returned from a visit to TU Delft (The Netherlands) where she met with Professor Roger Cooke and Assoc. Professor Dorota Kurowicka to discuss the use of Bayesian Belief Nets in the problem of graph dimensionality reduction when modelling large networks. Belinda also visited with Ass. Professor Steve Uhlig (also at TU Delft) to work on the problem of network alias resolution using geolocation of Internet hosts.

Belinda then travelled to Chantilly, Virginia (USA) to present recent research on anomaly detection in large network structures at a research colloquium on network modelling before continuing her research visit with Professor Cooke, who is based at Resources for the Future (Washington D.C.).

UniSA

Dr Yi Hong has accepted a faculty position at DEIS- Università della Calabria, Italy. She will be working with Prof Emanuele Viterbo.

OPPORTUNITIES

Title: **OFDM/MIMO Design Engineer**

NEC Australia leads the way in 3G and B3G mobile communications technologies. We are looking for a Design Engineer with interests in mobile communications to join our development team.

The features of this design area are:

System and sub-system design for physical layer

Research, algorithm development and evaluation

System modelling and simulation (Python, Matlab, C++) – link level simulations

System testing and integration

Participation in `System on a chip` design

Exposure to international standardisation process

The Design team works in global collaborations with internal and external design groups

Results orientated team environment

Unique opportunity to actually develop DSP algorithms and observe DSP algorithms in silicon and products.

Internationally competitive products

Multi-disciplined - opportunity to develop skills software and hardware

Division has engineers in all disciplines to enable complete product design

Ideally you would have experience in the following:

System design, DSP algorithms development and implementation, modelling, and some prior experience in wireless telecommunication are desirable technical requirements. Knowledge of OFDM and MIMO systems and low-level RTL design experience are additional advantages.

This is an exciting opportunity to work with leading edge technologies within a high competent team. If you are selected to join NEC you will enjoy an attractive remuneration package and collaborative team environment.

If interested in this or other positions at NEC Australia please send your resume to jobs1@nec.com.au

Title: **Graduate Systems Engineer - ATM**

NEC Australia is the Global Design Centre for NEC's wireline DSL and GPON broadband products for the world market; we are now looking for a Graduate Systems Engineer to join our team.

If chosen you will be involved in providing Systems Engineering support for sales and marketing activities for DSL and other related broadband technologies.

The key responsibilities for this position are as follows:

- Provide support to the presales activities by providing technical support for demonstrations, trials and lab evaluations
- Integrate NEC equipment with third party equipment and applications in NEC labs
- Attend customer premises for introduction of new technology and system releases
- Provide assistance with resolving technical problems and faults
- Assist implementation of systems in the field
- Preparing Tender submissions, source third party products, design systems and develop quotes and pricing information
- Provide training to customers and regional support staff

The key skills required for this role are as follows:

- Knowledge in access technologies (ie DSL, BPL and GPON), digital TV and or VoIP would be advantageous
- Knowledge of ATM and IP Networks
- Ability to work independently at client sites
- Ability to solve problems
- Engineering background or knowledge of data communications and telecoms
- Tertiary Qualification in Engineering and/or Communications related field
- Excellent written and verbal communication skills
- Willingness to travel

NEC Australia offers ongoing personal and professional training, competitive salaries, and the opportunity to work on global projects with leading edge technologies.

If interested in this or other positions at NEC Australia please send your resume to jobs1@nec.com.au

Coming Events

31 May – 6 June 2007	HPSR Conference – New York HPSR conference – New York http://eeweb.poly.edu/hpsr2007/
10-15 June 2007	IEEE ICC-2007 Honolulu, Hawaii http://hcac.hawaii.edu/conferences/aps2007/
24-28 June 2007	ICC2007 – Glasgow, Scotland http://www.icc2007.org/
24-29 June 2007	ISIT 2007 – Nice, France http://www.isit2007.org/
24-27 June 2007	COIN/ACOFT 2007 Melbourne http//www.coinacoft2007.com.au/
9-10 July 2007	ACoRN Workshop on C-operative Communications – Sydney http://www.acorn.net.au/event/cwworkshop07
16-17 July 2007	ACoRN Multihop Wireless Network Workshop – Adelaide http://www.acorn.net.au/event/mwnworkshop07/
2-6 Sept 2007	2007 IEEE Information Theory Workshop (ITW 2007) California, USA http://www.ece.tamu.edu/itw2007/
3-7 Sept 2007	IEEE PIMRC 2007 – Athens, Greece http://www.pimrc2007.org
17-21 Sept 2007	International Conference on Electromagnetics in Advanced Applications – Torino, Italy http://iceaa.polito.it/
19-23 September 2007	2007 Ninth International Conference on Spatial Information Theory – Melbourne http://www.cosit.info
16-19 Oct 2007	ISCIT 2007 - Sydney http://www.elec.ouw.edu.au/ISCIT2007/
18-20 Oct 2007	APCC 2007 – Bangkok, Thailand http://www.apcc2007.com/
6-9 Nov 2007	ACM SenSys 2007 – Sydney http://sensys.acm.org/2007/Home.html
19-21 Nov 2007	ICON 2007 – Adelaide, South Australia http://www.plevin.com.au/ICON2007/
26-30 November 2007	IEEE GLOBECOM http://www.comsoc.org/confs/globecom/2007/index.html
2-5 Dec 2007	ATNAC 2007 – NEW ZEALAND http://atnac2007.massey.ac.nz
3-6 Dec 2007	ISSNIP – Melbourne http://www.issnip.org/2007/index.html
17-19 Dec 2007	ICSPCS'2007 – Gold Coast Australia http://www.dspcs-witsp.com/icspcs_2007/cfp.html

Call for Papers

Due Date	Event Name
25 May 2007	ACoRN Workshop on Co-operative Communications – Sydney http://www.acorn.net.au/event/cwworkshop07
1 June 2007	IEEE Journal on Selected Area in Communications Multiuser Detection for Advanced Communicasion Systems and Networks
10 June 2007	ISCIT 2007 Sydney
16 June 2007	ACoRN Multihop Wireless Network Workshop - Adelaide
30 June 2007	ISSNIP Melbourne
20 July 2007	ICSPCS'2007 Gold Coast Australia
27 July 2007	ATNAC 2007 NEW ZEALAND

For a complete list of coming events and call for papers, see the event calendar.

Items of Interest

Australian telecom infrastructure poor by world standards

According to the World Competitiveness Score-board for 2007 released in Switzerland, Australia's overall ranking slipped from sixth to 12th on the listing of 55 nations with a sub-ranking of 21 for telecommunications infrastructure and 26 for mobile telephony costs.

Newsletter Items

If you have recently graduated, received an award, read an article that you have found useful, let us know so that we can share it with other ACoRN members. Please forward newsletter contributions directly to ACoRN Network Administrator christine.thursby@unisa.edu.au

Contact Us

If you have any queries about anything in the newsletter or any other related ACoRN information please visit the ACoRN website for full contact details at http://www.acorn.net.au/contact