ARC Communications Research Network

Newsletter February 2007

Convenors Report

Welcome to the first ACoRN Newsletter of 2007.

ACoRN has now been running for two years, and our operation is developing across the nation. It is an ongoing rewarding challenge to provide useful programs of activities for the ACoRN members, and to ensure we have a functional and adequate administrative framework. We are constantly improving on all counts, and the member activities are still increasing. To reach this level of operation has been the joint effort of all ACoRN members in general and some members in particular. For that we should all be congratulated.

In particular I want to acknowledge the hard work, good spirit and enthusiasm of Christine Thursby, our conscientious ACoRN Administrator. Her tireless efforts make sure the administrative machinery of ACoRN keeps spinning. Also our invaluable team of Local ACoRN Representatives deserves a high level of praise, bringing ACoRN in the forefront at the local arena. The 2006 ACoRN Executive Board is acknowledged for providing a steady hand in directing the course of ACoRN, and the strategic input of the 2006 ACoRN Advisory Board has once again made sure our activities are streamlined and moving ACoRN towards national and international recognition.

I respectfully extend my gratitude to all the ACoRN members that stepped up in 2006 and took on responsibilities for organising ACoRN events. Without your efforts, ACoRN would not be the success it is. Finally, a big thank-you to all ACoRN members, taking active part in ACoRN activities in 2006! We rely on your continuing support, ideas and engagement to take our community to the next level of excellence.

Best wishes to all of you for a prosperous and successful 2007.

Looking back at 2006

In 2006 we set out with yet another ambitious program, including workshops, schools, international and national conference events, international and domestic visits, and international visitors. Continuing the momentum from 2005, a strong series of events were organised under the ACoRN umbrella. To support a high level of postgraduate education, the ACoRN School Program offered three events, namely, the One-Day Tutorial on Internet Engineering, the ACoRN-NICTA Winter School, featuring an impressive set of International experts, and the ACoRN Spring School on Random Matrix Theory, LDPC Coding, and Multiuser Detection.

Bringing ACoRN members together in areas of common research excellence, the ACoRN Workshop Program featured two domestic events, namely, the ACoRN Workshop on MIMO – From Theory to Practice, held in connection with the IEEE Vehicular Technology Conference in Melbourne, and the Early Career Researcher's Workshop on Wireless Multihop Networks. Both events were very successful, receiving encouraging feedback from attending delegates. The ACoRN Workshop Program also launched the main ACoRN event for 2006; the inaugural NEWCOM-ACoRN Joint Workshop held in Vienna, Austria. Over one hundred delegates attended the workshop, of which twenty ACoRN members represented our community. The event was very successful, establishing many links which have already lead to further collaboration across the two Research Networks.

In addition, ACoRN provided financial sponsorship to the IEEE Vehicular Technology Conference held in Melbourne and the Passive and Active Measurement Conference held in Adelaide. Attendance grants for ACoRN members were further offered to attend established national events and International Conferences. In all, 182 conference/workshop/school attendance grants were awarded in 2006, compared to 161 in 2005.

A series of international visitors, partly or fully supported by ACoRN, came to Australia to visit ACoRN members. In 2006, we enjoyed visits from Prof. Ye Li (USA), Prof. J. Gavan (Israel), Dr. E. Viterbo (Italy), Prof. S. McLaughlin (Scotland), Prof. T. Chan (Canada), Prof. M. Debbah (France), and Prof. C. C. Chiu (Taiwan). In addition, ACoRN offered travel support for national and international research visits by ACoRN members. Visits were made to France, USA, The Netherlands, United Kingdom, Switzerland, Austria, Germany, Sweden, Singapore, Korea, Sydney, Melbourne, Adelaide, and Canberra. All together ACoRN supported 8 international visitors, 10 national travel fellowships/scholarships, and 13 international travel fellowships/scholarships. A full list of visitors and visits will soon be available on the website.

In summary, I think we can again this year be satisfied with the accomplishments of ACoRN. There is still room for improvements and more activities; however, in 2006 we presented, organised and hosted a breadth of engaging activities. We have established an enthusiastic and active group of local representatives, and ACoRN has vigorously been promoted as the Network for our community, and now enjoys a high level of visibility within ACoRN organisations and beyond. I am confident that we are well prepared for an even more successful 2007.

Looking ahead to 2007

Again in 2007 we have an ambitious plan of activities in terms of workshops, schools and international and national conference events. Our Workshop Program is still expanding with three confirmed events taking place this year, and with a further three events being in the planning process. We will have workshop events in the area of signal processing for optical communications and in the area of cognitive radio, as well as our annual early career researcher's workshop on wireless multihop networks. In addition, we are looking into organising a joint workshop on sensor networks together with the ARC Research Network on Intelligent Sensors, Sensor Networks and Information Processing, as well as a joint workshop on iterative signal processing together with NEWCOM. Furthermore, we will investigate opportunities for organising a series of Australian Industry Days together with the Telecommunications Society of Australia.

In terms of school events, we have already had the ACoRN Summer School on Modern Coding Techniques in February. Furthermore, the ACoRN-NICTA Wireless Winter School will hopefully be consolidated as an annual fixture in the ACoRN calendar. Later in the year, plans include a school on OFDM technologies, and a school on networks and protocols.

On the International conference scene in Australia, ACoRN has so far decided to sponsor the 5th ACM Conference on Embedded Networked Sensor Systems to be held in Sydney. ACoRN will also take active part in bringing the Asia-Europe Workshop on Information Theory to Australia in 2007. The location is still to be decided, but we are confident the event will take place down under. In addition, ACoRN will continue to offer attendance grants to the established national events, AusCTW, ACOFT, ATNAC and WITSP, as well as recognised international conferences held overseas.

All in all, we have an eventful 2007 to look forward to.

Lars K. Rasmussen
ACoRN Network Convenor

Local ACoRN Representatives

The Local ACoRN representatives met in Adelaide after AusCTW. Most institutions were represented. Lars summarised events of 2006 and plans for 2007. 2006 was a good year with most organisations reaching their target for travel. Ideas on how to make ACoRN even more successful in future years were discussed. Greater emphasis will be put on visits to increase mobility throughout the network.

Please support the Local ACoRN Representative at your organisation. They are doing a great Job.

News From Adelaide University

Upcoming Conference/Research Travel

Lang White will take sabbatical leave from April, which will include a research visit to ENST (France), to follow up on ongoing collaborative research.

Matthew Roughan will be spending a month at AT&T Labs in New Jersey to visit a number of people including Walter Willinger and Jenifer Yates, and in addition will be spending time at Princeton to visit Jennifer Rexford.

Sanjeev Naguleswaran and *Lang White* will be co-chairing a special session on "Quantum Walks and Noise" at the Conference on Fluctuations and Noise in Florence.

Belinda Chiera will be travelling to TU Delft in April to visit Dorota Kurowicka and Steve Uhlig to discuss issues pertaining to the analysis of large networks, before heading over to Washington to attend a research fellowship colloquium.

Ashley Flavel will be travelling to Ottawa to present the following paper accepted at ITC: "Modelling BGP Fluctuations" (co-authored with fellow ACoRN members M. Roughan, N. Bean and O. Maennel).

New People at University of Adelaide

Dr Hui Tian from the University of Science and Technology of China, has recently joined Adelaide University as a postdoctoral research fel

low to work on Network Tomography under Matthew Roughan in the School of Mathematics.

Milestones

Tommy Chee submitted his Ph.D. thesis entitled: "Downlink Resource Allocation for Orthogonal Frequency Division Multiple Access", supervised by Dr C.C. Lim and Dr. J. Choi.

Limin Yu submitted her Ph.D. thesis entitled: "A Wavelet Approach to Doppler-Robust Broadband Communication System Design", supervised by Prof. L. B. White and A/Prof. B. Davis.

Jack Sudarev submitted his Ph.D. thesis entitled: "An Admission Control Problem for 802.11 Wireless Networks", supervised by Prof. L.B. White and Dr M. Sorrell.

Congratulations to ACoRN members

Adelaide University

Matthew Roughan received a promotion to the position of Associate Professor.

Siew-Lee Hew submitted her Ph.D. thesis entitled: "Wireless Optimisation based on Economic Criteria", supervised by Prof. L.B. White, Dr P. Chapman and Dr. M, Sorell which has just been accepted. Congratulations Dr Hew!

Jeremy McMahon won the Head of School's Award for Lecturing Excellence.

UniSA

Craig Burnett left UniSA at the beginning of January to take up a position in Cambridge Technology Park in the UK. He will be working for TTPCom on 3G LTE development involving OFDM, MIMO and LDPC implementations. For all those traveling to the UK, feel free to get in contact.

Ingmar Land, Assistant Professor for communication theory at Aalborg University, Denmark, has joined ITR, University of South Australia for one year. His research topics are channel coding, iterative decoding, Information theory, and in particularly the links in between those topics.

Victoria University

Himal Suraweera from Monash University, Phillip Conder from University of Wollongong, Jason Gao from Telstra and Terence Betlehem from ANU have recently joined Professor Mike Faulkner at Centre for Telecommunications and Microelectronics (CTME), Victoria University. They are currently working as research fellows on the physical and link layer in wireless systems.

ACoRN Member Profile

Michael Rumsewicz

Michael Rumsewicz joined the Teletraffic Research Centre at the University of Adelaide in 2002 and became Director in March 2004. In July 2006 he became Director of The Centre for Defence Communications and Information Networking at the University of Adelaide.

At the Teletraffic Research Centre, Michael has provided technical leadership on a broad range of projects, including analysis of call centre routing strategies for the Australian Taxation Office, analysis of Voice over IP, GPRS and 3G WCDMA systems for Telstra, research into scalable distributed systems for the Smart Internet Technology CRC, analysis of scheduling disciplines and Quality of Service mechanisms for Foursticks, research and development of network analysis techniques for Tenix, and a number of networking and statistical analysis projects with DSTO.

Prior to joining the TRC, Michael was with Ericsson Australia where he was the Team Leader of the Network Research group. Under his leadership the group undertook research and development in distributed systems, network measurement and analysis and congestion control.

From 1994 to 1999 Michael led performance analysis research at The Software Engineering Research Centre of The Royal Melbourne Institute of Technology, where he developed new concepts on robustness and scalability for distributed web server platforms and subsequently managed their technology transfer to Ericsson.

From 1988 to1994 Michael worked at Bellcore (USA) as a member of the Network Services Performance and Control Group, specialising in performance analysis of telecommunications systems and played a leading role in Signalling System Number 7 congestion control research and outage analysis efforts.

He has undertaken a number of consulting activities, including projects for Austel, the Australian Taxation Office, the Office of the Telecommunications Authority (Hong Kong), Telcordia (USA), NSW Crown Solicitor's Office, Olympic Co-ordination Authority, Qnetworx (USA), the Metropolitan Ambulance Service Royal Commission and the Victorian Department of Justice.

Michael undertook his undergraduate and postgraduate studies at The University of Adelaide, completing his Ph.D. in Applied Mathematics in 1988 in the applied probability area. In 2004 he was made a Professorial Research Fellow of The University of Adelaide. He has written over 40 refereed journal and conference articles, has 3 patents granted or pending, and has been a reviewer and programme committee member for a number of international conferences.

For more information go to http://www.trc.adelaide.edu.au

WORKSHOP REPORTS

ACoRN Summer School

The ACoRN Summer School this year was focused on Modern Coding Techniques, and presented by Dr. Jossy Sayir (FTW, Austria) and Dr. Ingmar Land (Aalborg University, Denmark). The course was originally developed within NEWCOM, and presented at Aalborg University as a Postgraduate course open to all NEWCOM students. It was therefore a great opportunity for ACoRN to bring this course to Australia, providing a course at the forefront of International research.

Over five exciting and challenging days, fundamentals of modern coding techniques, such as turbo and LDPC coding, analysis and design techniques, as well as recent research results and current research problems were presented in a relaxed and informal setting. Interactive lectures were conducted in the morning, followed by supervised exercises in the afternoon.

Scheduled just prior to the AusCTW in Adelaide, 26 lucky students were able to enjoy the course. The course was cleverly organised to offer valuable input to both the novice in modern coding techniques, as well as to the expert.

A further benefit of the school was to bring together research students from across Australia, working in the area of coding and information theory. New contacts were made, and many new research ideas were enthusiastically proposed and discussed. School events provide the perfect environment for inspired learning, creative thinking, and innovating discussions.

The ACoRN School program continues to be the success story of ACoRN. It has received very positive feedback from attending students, and ACoRN will make sure to organise similar events in connection with future conference and workshop events across Australia. Plans are already in the making for an ACoRN Winter School on advanced techniques for OFDM.

Dr Yossy Sayir & Dr Ingmar Land

Australian Communications Theory Workshop 2007

The eighth Australian Communications Theory Workshop, AusCTW07, was held at The University of Adelaide on February 5-7, 2007. Returning to Adelaide for the first time in six years, the workshop was organised through the efforts of a combined local committee comprised of ACoRN members from the University of Adelaide and the University of South Australia. Attendance was the second highest in the history of AusCTW, with a total of 118 registered attendees converging on Adelaide from far and wide. In addition to our "regular" participants from Australia and New Zealand, we were pleased to welcome first time attendees from the Telecommunications Research Centre (FTW) Vienna, the University of Aalborg (Denmark), National Chiao Tung University (Taiwan) and Hanbat National University (Korea). Another first for AusCTW was the provision of wireless Internet access, of which the majority of attendees took enthusiastic advantage. The combination of fifteen technical presentations over two and a half days with 87 registered poster papers over three sessions provided the perfect scenario for many stimulating discussions and much social interaction.

The first day kicked off with an engrossing and highly relevant Research Overview, delivered by Jossy Sayir (FTW), who explained the usefulness of EXIT charts in iterative decoding. After a warm reception, focus shifted to the first of three poster sessions where attendees congregated to discuss and debate the latest research spanning Layers 1 to 4 of the Internet. The afternoon continued with a series of technical presentations

and while the air-conditioning was unable to keep up with the pace, the attendees braved out the weather until the very end of the day, when Peter Smith provided some much needed relief from the heat with an informative and highly entertaining talk including an illustration of channel coding using the common straw.

On a much cooler second day, talks commenced with a refreshingly alternative Research Overview on the technology of the Bionic Ear, by David Grayden from the University of Melbourne. The captivated audience were treated to a fascinating insight into the complexity of the inner ear mechanism, with audience participation encouraged with an on-the-spot hearing test. Following the morning's talk was a very well-attended and highly interactive poster session, before the day continued with the technical sessions. Speakers included Ingmar Land (University of Aalborg, currently visiting UniSA), who gave the sequel to the Research Overview by Jossy Sayir and presented a simple and mathematically elegant technique to bound EXIT functions. The day closed with the Annual General Meeting of the IEEE Joint Information Theory Chapter before moving on to the banquet dinner.

The workshop banquet on Tuesday evening was held in the historical Bradman Room at The Adelaide Oval. Surrounded by a rich cricketing history recorded through memorabilia of the game's greatest legend, the attendees socialised during pre-dinner drinks before moving onto the sumptuous three-course banquet that followed. Alex Grant addressed the attendees on behalf of the Steering Committee and thanked all individuals involved, including the sponsors who continue to support this great event, before concluding with the important announcement of the location of AusCTW08. Having learned we will convene in New Zealand next year, an impromptu vote of the workshop's dates was conducted by Peter Smith. After some jostling over the importance of our respective public holidays, the exact dates of the event were determined. The formalities over, the attendees then watched the conclusion of the 20/20 match between England and New Zealand, with next year's host country walking away the eventual victor.

The final day of the workshop began with a well attended and timely Research Overview by Jean Armstrong (Monash University), who discussed the research trends in OFDM and earmarked the wave of the future: optical OFDM. After a much needed coffee break for some of our more party hard attendees, attention turned to the third and final poster session of the workshop, which once again prompted much research discussion amongst the participants. Following the poster session was a presentation by Lars Rasmussen on the ACoRN program for 2007, which included interactive discussions on budget expenditure and the direction ACoRN will take over the coming year. The student awards were then announced, with Roy Timo (NICTA) taking the AusCTW07 Best Student Paper Award, Ido Nevat (UNSW) won the best student poster award and Yi Hong (ITR), the NICTA-ACoRN Early Career Researcher Award. Belinda Chiera, the Workshop General Chair, officially closed AusCTW07 with the knowledge that next year AusCTW will be moved offshore, is a sign of better and brighter things to come for this fantastic event.

On a final note, there were many people involved in ensuring AusCTW07 was a resounding success. Many thanks to the members of the Organising, Technical Program and Steering Committees, for overseeing the planning of AusCTW07. Special thanks must also be given to Chris Ford and Shaun Stupis (ITS University of South Australia and the University of Adelaide), for providing wireless access to the workshop attendees and to Stephen Guest for his generous logistical support. Appreciation is also expressed to the presenters, contributors and reviewers, as well as to the volunteers who provided much help and support behind the scenes, including Sandy Sherry and Christine Thursby. Lastly, and most importantly, we thank the sponsors who, through their continuing generous support, play a vital role in ensuring the longevity of AusCTW for current and future generations of communications theory researchers.

Dr Belinda Chiera

Opportunities

Position available at NEC Australia

Title: Junior ASIC/FPGA Engineer - RTL/VHDL

Summary: Our Mobile Terminals ASIC Division is now looking for a Junior ASIC/FPGA Desig Engineer to join their team.

Description: NEC Australia leads the way in 3G mobile communications technologies. We are currently seeking a Junior ASIC Hardware Engineer to join our team.

If chosen for this role you will be working on the design and development of FPGA/ASIC to meet user or product requirements, working with the entire product development lifecycle, preparing tests for hardware design, designing and developing VHDL codes for FPGA and ASIC's to be used in mobile communications products to meet user or product requirements, developing scripts for integration testing, defining and preparing test benches for the target device and simulating and verifying design.

To be considered for this role it is essential that you have a solid background in the following;

- ASIC/FPGA Design
- RTL Knowledge
- Experience with the full product life cycle
- Task estimation, scheduling and reporting
- Solid hands on experience in microprocessor based hardware design, DSP and , programmable logic devices,
- VHDL or Verilog
- strong Unix knowledge

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

If interested in this or other positions within NEC Australia please send you resume to jobs1@nec.com.au
Location: Melbourne - East
Classification: IT & T
Sub Classification: Hardware
Position Type: Full Time

Other News

CALL FOR ABSTRACTS: MELBOURNE 12-13 April 2007

This is a call for abstracts for the postgraduate student conference in the area of signals and systems (control, signal processing and related fields) to be held in Melbourne on the 12th and 13th of April 2007. Postgraduate students are given an opportunity to present their work to an audience consisting of academics and their fellow students. There will be no review process and the goal is to give each interested student an opportunity to present their work. The duration of talks is 20 minutes with a possibility of a longer keynote lecture presented by a senior academic. Titles of talks and one page abstracts need to be emailed to Prof. Dragan Nesic ***before 20 March 2007.***

Important dates:

20 March 2007*:* Deadline for submission of title and one page abstracts to Prof. Dragan Nesic (d.nesic@ee.unimelb.edu.au)

1 April 2007: Conference Program with a detailed timetable and venue will be published.

12-13 April 2007: Conference to be held at The University of Melbourne

Other information:

* The conference is sponsored by the ARC network on Intelligent Sensors, Sensor Networks and Information Processing (convenor: A/Prof. M. Palaniswami).
* No conference registration will be charged.
* Participants need to organize their own travel and accommodation. We will be sending shortly more information regarding possible options for accommodation.
* The conference organizers will provide lunch on both days, coffee and a dinner on the first day.
* Contact: Prof. Dragan Nesic (d.nesic@ee.unimelb.edu.au).

IREEL: Remote Experimentation with Real Protocols and Applications over Emulated Network

Every networking teacher has faced the difficult problem to illustrate their courses with real networking experiments. During such courses, experimentation is a common way to understand and quantify both functional and nonfunctional properties of networking protocols. Indeed, in order to facilitate the learning of the theoretical basis, students should see and study the real behavior of the network and transport protocols and the resulting impact on the applications.
This is generally accomplished through experimentation.

Building testbed, running experiments, observing packets exchanges and measuring systems performance from real protocol implementations are typical tasks for the network experimenters. These tasks usually incur a high setup and maintenance cost in time and efforts for the experimental testbed (machines, operating systems, applications), which is a significant burden for the teacher. In addition, using a testbed often does not allow the participation of the entire classroom simultaneously. Finally and importantly, the typical network setup has some serious limitation in the range of network conditions available to students to experiment with.

IREEL is a virtual laboratory allowing students to drive experiments with real Internet applications and endtoend protocols in the context of networking courses. This platform consists in a remote network emulator offering a set of predefined applications and protocol mechanisms. Experimenters configure and control the emulation and the endsystems behavior in order to perform tests, measurements and observations on protocols or applications operating under controlled specific networking conditions. A set of endtoend mechanisms, mainly focusing on transport and applicationlevel protocols, are currently available. IREEL is scalable and easy to use thanks to an ergonomic web interface.

The main goal of IREEL is to facilitate the experimental study of endtoend transport protocols and applications, using an emulation system that allows packet impairments to be introduced. This allows experimenters to test protocols and applications under a wide range of network conditions, without the burden of an experimental setup to operate and maintain. The platform is strongly configurable allowing other protocols and application to be integrated. Control on the emulation system, and on the end systems will be given to experimenter in order to perform experiments through a web interface. This platform is currently tested and improved in the context of the dissemination activity of the EuQoS European Integrated Project.

IREEL is the result of a strong collaboration between NICTA and LAASCNRS/ENSICA in the context of the European 6th framework project EUQoS.

IREEL is available online at: http://ireel.npc.nicta.com.au/
Contact: ireel@nicta.com.au

Call for Papers

Due Date	Event Name
2 March 2007	2007 Ninth International Conference on Spatial Information Theory – Melbourne http://www.cosit.info
31 Mar 2007	APCC 2007 – Bangkok, Thailand http://www.apcc2007.com
30 Jun 2007	ISSNIP - Melbourne http://www.issnip.org/2007/index.html
1 Aug 2007	EURASIP Journal on Wireless Communications and Networking on Theory and Applications in Multi-user/Multi-terminal Communications (special issue) – http://www.hindawi.com/journals/WCN/si/tamum.html

Coming Events

11–15 March 2007	IEEE Wireless Communications and Networking Conference (WCNC 2007) - Hong Kong http://www.ieee-wcnc.org
25-29 March 2007	Optical Fiber Communications 2007 Anaheim USA http://www.ofcnfoec.org/
23-25 April 2007	VTC2007 – Dublin, Ireland http://www.ieeevtc.org/vtc2007spring/index.php
31 May – 6 June 2007	HPSR Conference – New York HPSR conference – New York http://eeweb.poly.edu/hpsr2007/
24-28 June 2007	ICC2007 – Glasgow, Scotland http://www.icc2007.org/
24-29 June 2007	ISIT 2007 – Nice, France http://www.isit2007.org/
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
19-23 September 2007	2007 Ninth International Conference on Spatial Information Theory – Melbourne http://www.cosit.info
18-20 Oct 2007	APCC 2007 – Bangkok, Thailand http://www.apcc2007.com/
26-30 November 2007	IEEE GLOBECOM http://www.comsoc.org/confs/globecom/2007/index.html

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