ACoRN

ARC Communications Research Network

Newsletter January 2006

Convenors Report

Convenor's Report

Welcome to the first ACoRN Newsletter of 2006.

ACoRN has now been up running for one busy year. It has been a challenge to provide both useful programs of activities for the ACoRN members, and to build up a functional and adequate administrative framework. After an initial start-up phase, the networking activities, as well as the administrative procedures, have constantly improved. The member activities are still increasing and our online application system has eased the access to support. 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.

Some members deserve to be further acknowledged. I would especially like to express my gratitude to the members of the 2005 ACoRN Executive Board for their hard work throughout the year. The same level of gratitude goes to our invaluable group of Local ACoRN Representatives, and to the enthusiastic group of ACoRN members that took the time to organise ACoRN events in 2005 for all of us to enjoy. Without the voluntary efforts of these people, ACoRN would not be able to operate. Finally, I would like to acknowledge the ACoRN Advisory Board for the great help and advice they have offered, making sure that our activities are streamlined and moving ACoRN towards national and international recognition.

Best wishes to all of you for a prosperous and successful 2006.

Looking back at 2005

In 2005 we set out with an ambitious program, including workshops, schools, international and national conference events, international visitors, and the development of the ACoRN website. It took some time to gain momentum and visibility for ACoRN, but we met most of our targets within the four programs of activities. 2005 saw the first ACoRN AusCTW tutorial day, the ACoRN Workshop on cross-layer design problems for wireless communication, the CUBIN/ACoRN Information Theory Workshop, the ACoRN-NICTA Wireless Winter School, and the ACoRN Spring School on Coding and Information Theory.

In addition, ACoRN provided financial sponsorship to the IEEE International Symposium on Information Theory held in Adelaide and the IEEE Local Computer Networks Conference held in Sydney. Attendance grants for ACoRN members were further offered to attend the IEEE Asia-Pacific Conference on Communications held in Perth, and the established national events: the Australian Communications Theory Workshop held in Brisbane; the Australian Conference on Optical Fibre Technology held in Sydney; the Australian Telecommunications, Networks and Applications Conference (jointly with IEEE Tencon) held in Melbourne; and the Workshop on the Internet, Telecommunications and Signal Processing (jointly with DSPCS) held in Noosa Head. Attendance grants were also offered for attending overseas conference events. In all, 195 conference/workshop/school attendance grants were awarded in 2005.

A series of international visitors, partly or fully supported by ACoRN, came to Australia to visit ACoRN members. In 2005, we enjoyed visits from Dr. A. G. Amat (Spain), Dr. F. Brannstrom (Swe-

den), Dr. E. Viterbo (Italy), Prof. D. Tse (USA), Dr. G. Kramer (USA), Dr. E. Uhlemann (Sweden), Prof. L. Haro (Spain), Dr Pascal Vontobel (USA), Prof Minkyu Song (Korea), Michael Pietrzyk (Holland), Dr. Wei Wu (Canada). In addition, ACoRN offered travel support for national and international research visits by ACoRN members. Visits were made to France, Italy, USA, Bangladesh, Japan, Holland, New Zealand, Sydney, New South Wales and Adelaide. All together ACoRN supported 5 international visitors, 4 national travel fellowships/scholarships, and 10 international travel fellowships/scholarships. A full list of visitors and visits will soon be available on the website.

In 2005, we also released our new and improved ACoRN website featuring an online application system. This has significantly streamlined the application processes for funding support, and the system is continuously being updated to provide an even better interface. All members are encouraged to provide feedback to the system for further improvements.

Finally, in 2005 ACoRN and NEWCOM signed a memo of understanding with respect to research collaboration. As part of this collaboration, a jointly funded researcher exchange program has proven itself very useful. Another visible outcome is our joint annual workshop with the first event scheduled for September 2006.

In summary, I think we can be satisfied with the accomplishments of ACoRN in 2005. There is room for improvements and more activities; however, in 2005 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 2006.

Looking ahead to 2006

Again in 2006 we have an ambitious plan of activities in terms of workshops, schools and international and national conference events. The flagship of events is the joint ACoRN-NEWCOM workshop in September in Vienna, Austria. ACoRN members are strongly encouraged to attend this event. ACoRN will centrally fund 100% of attendance costs for a small number of members from each ACoRN organisation. Members can also seek funding for attendance through the existing ACoRN support system. In addition, we are looking at running four national ACoRN workshops with the following tentative topics: MIMO, from

theory to practise; Iterative detection and decoding; Wireless networks; and Signal Processing for Photonic Communication.

In terms of school events, we are having the free ACoRN tutorial day in connection with AusCTW. Prof. Lang White is presenting a tutorial on Internet Technologies. Furthermore, the ACoRN-NICTA Wireless Winter School will hopefully establish itself as a recurring annual event, and a weeklong school on Basic Information Theory, conducted by two international experts are currently being considered. A workshop on ARC grant proposal writing will also be organised, intended for ECRs.

On the International conference scene in Australia, ACoRN has so far decided to sponsor the IEEE Vehicular Technology Conference in Melbourne in May as well as the Passive and Active Measurement Workshop in Adelaide in March. In addition, ACoRN will continue to offer attendance grants to the established national events, AusCTW, ACOFT, ATNAC and WITSP, the new national event this year, AusWireless, as well as recognised international conferences held overseas.

All in all, we have an eventful 2006 to look forward to.

Travel Grants for Joint ARC Proposal Preparation

Now is the time to apply for a Travel Grant for a joint ARC grant proposal preparation. The grant is intended to support travel in connection with joint ARC Discovery Grant and Linkage Grant Applications. More details are available on the ACoRN website.

ACoRN-NEWCOM Workshop

ACoRN-NEWCOM Workshop
20-22 September 2006, Vienna, Austria
The organisation of the joint workshop is progressing in terms of technical program and local arrangements. The tentative technical program offers 4 half-day tutorials on the first day of the workshop. Topics are yet to be decided. The remaining two days offer two parallel tracks with three sessions for oral presentations and one session for poster presentations per track per day. Each day will further feature a panel discussion and a plenary talk. Submitted papers will be peer-reviewed and accepted papers will be published in the CD workshop proceedings. The proceedings will be assigned an ISBN number, and thus will be an official publication. A call-for-papers for the event is in preparation and will be distributed shortly. At the same time, the workshop webpage will be released. The expected number of delegates at the workshop is around 235 with 200 expected participants from NEWCOM and around 35 participants from ACoRN.

A tentative venue has been selected for the event. TechGate Vienna is a modern building complex located eight minutes subway ride from the city centre and only a couple of minutes walk from the Danube. For more details on the venue, check the website (http://www.techgate.at/english/home/).

The ACoRN Executive Board has decided to centrally fund 100% of the attendance costs for a small number of ACoRN members from each ACoRN organisation eligible to receive ARC funding. A final decision regarding the total number of centrally funded members to be supported will be made once the conference fees and accommodation expenses have been determined. Each ACoRN organisation is free to plan for any additional participants to attend the workshop funded through the local ACoRN budget based on the 50% financial support rule. ACoRN members are encouraged to take the opportunity to visit relevant NEWCOM researchers for a period of time in connection with attending the workshop, aiming for establishing joint research activities.

ACoRN-Workshop

MIMO from Theory to Practice

Victoria University will be hosting a workshop on "MIMO Antenna Systems - From Theory to Practice" on 4th & 5th May 2006 in connection with the VTC 2006 in Melbourne. Further information will be available on the website within the next few weeks. Make sure you write these dates in your diary.

ACoRN Visitors

ACoRN has sponsored many international visitors in 2005 and already applications are being received for 2006. To ensure that overseas visitors are given maximum exposure whilst visiting Australia, we are going to request that an expression of interest is lodged with ACoRN, prior to the visit so that other ACoRN institutions have the opportunity to benefit from the visit.

Previously ACoRN did not know of international visitors until the funding application was received and at that stage the flights, accommodation and a timetable for the visitor had generally been booked with no room for other organisations to take advantage of the visit.

We understand that not all visitors will have additional time, but some visitors may be prepared to spend an extra few weeks in Australia to establish links with other Australian institutions.

A form expressing interest of an invited guest will be included on the ACoRN website in the next few weeks.

ACoRN Member Profile

Dr Yi Hong

Dr. Yi Hong completed her PhD in the area of communication theory and signal processing from the University of New South Wales, Sydney, in October 2004. From Oct. 2004, she has been working as a postdoctoral fellow at the Institute for Telecommunications Research, University of South Australia, together with Profs. Alex Grant and Lars Rasmussen.

In 2005, Dr. Hong was nominated for the early career researcher (ECR) Cohort program 2005 at University of South Australia. She was awarded a grant from the University of South Australia ECR supported scheme. From 2000 to 2004, Yi Hong received an International Postgraduate Research Scholarship (IPRS) from the commonwealth of Australia, a supplementary Engineering Award from the School of Electrical Engineering and Telecommunications at the University of New South Wales, and a Wireless Data Communication System Scholarship from University of New South Wales.

Since her PhD commencement in 2000, Dr. Hong has been an active researcher making contributions to code design for space-time multiple-input multiple-output (MIMO) schemes; performance analysis and code design for MIMO Orthogonal frequency division multiplexing (OFDM) systems; development of low complexity iterative decoding algorithms for coded MIMO systems; super-orthogonal space-time trellis code design. Her current research interest also includes coding for broadcast channels, linear processing for MIMO downlinks, and low complexity detection schemes. Of particular significance in Dr. Hong's working areas is the development of optimum space-time coding techniques. These methods are widely applied by many authors in multi-antenna communication theory. Her work on fast iterative decoding algorithms resulted in one of the most efficient decoding methods to date for coded MIMO channels. Her contributions were published as invited and/or standard papers in top international journals and conferences, such as the IEEE Transactions on Vehicular Technology, the International Journal of System Science, and the International Symposium on Information Theory.

Dr. Hong is a member of IEEE and a member of ARC Communications Research Network (ACoRN). She has served in various professional roles in her area of expertise including reviewing for IEEE transactions and conferences, serving on the Technical Program Committee of the International Conference on Advanced Data Mining and Applications 2005, serving as chairman of a session on space-time coding at the IEEE Vehicular Technology Conference (Spring) Sweden in 2005. She has been invited to visit University of Queensland, as well as being a visiting fellow at the École Nationale Supérieure des Télécommunications in France, the Dipartimento di Elettronica del Politecnico di Torino in Italy, and the University of New South Wales.

In addition to her research career, she has gained industrial experience as a project manager and electrical engineer for two years in the Beijing Petrochemical Eng. Corp. She was in charge of three major processing system development projects. The Yanshan Project was awarded "**Best Project Award**" by China Petrochemical Corporation, 1999. Dr Hong successfully developed a novel mutual inductance sensor and communication software for Electromagnetic Tomography system when she was a postgraduate student in Tianjin University, China. This technique was issued a Chinese patent (Patent No: CN1194375A).

Workshop Reports

The 30th IEEE Conference on Local Computer Networks

The IEEE LCN was held on Nov. 16-17 in Sydney. ACoRN was a financial sponsor of the event together with NICTA, UNSW and BBN Technologies. The program boasted 87 papers from around the world, and two Australian keynote speakers. Dr. David Skellern (CEO,NICTA) gave a talk entitled "*Computer Networking for an Embedded Systems World,*" while Dr. Geoff Huston (Asia Pacific Network Information Centre) gave a talk entitled "*The Evolution of Internet Architecture.*" A detailed program can be found through the IEEE LCN home page under "Prior LCN Conferences," http://www.ieeelcn.org/.

The Australian Telecommunications, Networks and Applications Conference (ATNAC) joint with IEEE Tencon 2005

The ATNAC conference was this year part of the IEEE region 10 conference, IEEE Tencon 2005. The events were held on Nov. 21-24 in Melbourne under the theme "A Meeting Place for Converging Technologies and People". The joint events attracted over 800 paper submissions from more than 40 countries, of which 530 papers were accepted for oral and poster presentations in 102 technical sessions. Among the six keynote speakers, Prof. Rod Tucker gave a talk entitled "Towards an Optical Internet". A detailed program can be found through the IEEE Tencon home page http://www.tencon2005.org/.

Relevant events of the next few months

Three main events in Australia and a NEWCOM school event in Italy will take place over the next few months.

The Australian Communications Theory Workshop (AusCTW) 2006 will be held on 1-3 February in Perth. An exciting program has been put together with informative research overviews, detailed technical talks and many poster presentations. Visit the AusCTW home page for the detailed program at the link http://ausctw06.watri.org.au/. Again this year, ACoRN is organising a free one-day tutorial prior to AusCTW. Prof. Lang White is presenting a tutorial on Internet Technologies. More details are found at the web link: http://www.acorn.net.au/event/iietutorial/.

A new local conference is running for the first time in 2006. The IEEE International Conference on Wireless Broadband and Ultra Wideband Communications (AusWireless) 2006 will be held on 13-16 March in Sydney. More details about the technical program and tutorials can be found on the conference home page http://epress.lib.uts.edu.au/ocs/index.php?cf=1.

The seventh Passive and Active Measurement (PAM) conference will be held on March 30-31, 2006 in Adelaide, Australia. This event focuses on research and practical applications of network measurement and analysis techniques. ACoRN is the Program and Proceedings sponsor of PAM 2006. More details about the program can be found on the conference home page http://www.pam2006.org/.

Finally, NEWCOM is inviting ACoRN members to attend the NEWCOM School on Mathematical Aspects of High Performance Codes: State of the Art and Open Problems. This event will be on January 31st to February 3rd in Pisa, Italy. There is no registration fee, but registration must be done via the web. Prof. Andrea Montanari (Ecole Normale Superieure, Paris, France) will present a tutorial entitled "Large random systems: From coding to optimization and statistical mechanics," Prof. Tom Richardson (Flarion Technologies, USA) will present a tutorial entitled "Low density and turbo codes: structure and iterative decoding," and Prof. Pascal Vontobel (University of Wisconsin-Madison, USA) will present a tutorial entitled "Codes over graphs and decoding algorithms". More details are found on the course information page on the NEWCOM news web link: http://newcom.ismb.it/public/contributes/ScuolaCRM061.pdf.

DSPCS/WITSP'2006

The 8th International Symposium on DSP and Communication Systems combined with the 4th Workshop on the Internet, Telecommunications and Signal Processing was held between 19th and 21st December 2005 at Noosa Blue Resort, Noosa Heads, at Queensland's Sunshine Coast. The combined Symposium and Workshop were sponsored by: DSTO, AT-CRC, ACoRN, and supported by the SA Section of IEEE. The response to the original call for papers has exceeded the expectations of an Organizing Committee, with 164 full paper submissions. All submitted papers have been peer reviewed, and each paper received at least two but mostly three peer reviews. Based on those reviews, 80 papers have been accepted, and finally, 77 included in the program - 50 for oral and 27 for poster presentations. In addition, there were two invited keynote presentations delivered by Prof. Bahram Honary of the University of Lancaster and Prof. Michael Steer of North Carolina State University. The titles of their respective presentations were "Recent Results on Construction of Structured LDPC codes" and "The Interplay of Signal Processing, Communication Technologies and RF Circuit Design with Perspectives on the Future of RF and Microwave Engineering". The event was very well attended by delegates from both Australia and overseas with the total number of attendees reaching 75.

Assoc Professor Tad Wysocki

Professor Bahram Honary

Professor Michael Steer

Graduations and Appointments

Congratulations

Professor Abbas Jamalipour, one of the ACoRN's Executive Committee Members from the University of Sydney, has just been named as the new Editor-in-Chief of the IEEE Wireless Communications Magazine for the 3-year term 2006-2008, by the IEEE Communications Society President-Elect Nim K. Cheung.

IEEE Wireless Communications Magazine is an interdisciplinary bimonthly magazine, covering technical and policy issues relating to personal, location-independent communications in all media and at all protocol layers. It is one of the most prestigious publications in the field of telecommunications and is currently ranked four on the list of ISI publications in the field of telecommunications.

Abbas will be the first EiC for the Wireless Communications to be appointed from Australia and the only current EiC of all Communications Society publications in Australia. This appointment will increase the international visibility of Australia and its researchers. His term will start in January 2006

Congratulations

Associate Professor Tad Wysocki, a member of the ACoRN Executive Committee from the University of Wollongong, has been appointed to Associate Editor of the IEEE Transactions on Microwave Theory and Techniques in the areas of Coding, Communications Theory, Networks, and DSP. Tad is the first Associate Editor for the Transactions on MTT from the southern hemisphere.

Congratulations

At the "Telecommunications Society of Australia Awards Luncheon" in Melbourne in October, Dr. Paul Alexander, CTO Cohda Wireless (and ITR alumnus) was announced as winner of the 2005 John & Yvonne Almgren TSA Innovation Encouragement Award.

Paul was recognized for his pioneering work in the area of advanced digital signal processing techniques for OFDM-based systems that address the effects of high-speed mobility and harsh non-line of sight propagation. The net result of this work is a more robust physical layer that is capable of delivering mobile broadband connectivity in the harshest, outdoor radio environments. Furthermore, these techniques can be applied on any standards based OFDM-based system, including 802.11a/g/n ("Wi-Fi"), 802.16-2004 ("WiMax") and the proposed 802.16e standard ("Mobile WiMax"). "Paul has been a pioneer in the area of mobile broadband communications and the work that he has led has broad applicability across major markets, including outdoor Wi-Fi mesh networks and with public safety customers", said Martin Suter, CEO of Cohda Wireless. "The recognition by TSA confirms what we already knew – that Paul is a world-leader in this space."

The nominees for this award were required to have played the leading, hands-on role in the development of the innovation. The criteria for selection included the demonstration a high level of innovation and ingenuity, to be of clear market value, to be of significant immediate impact for the telecommunications industry in Australia, and to support a continuing global reputation of Australian telecommunications.

The purpose of the Award is to recognise innovation in the field of Telecommunications, and through that recognition, to encourage further innovation both by the recipient of the award and by others.

Congratulations

Dr Steven Gordon and Dr Aruna Jayasuriya have both been promoted to Senior Research Fellow in the current UniSA promotion round.

Congratulations

Rodney Kennedy, Wireless Signal Processing Program, National ICT Australia (NICTA), and Thushara Abhayapala, Research School of Information Sciences and Engineering, The Australian National University, Canberra have been engaged as a Guest Editors, together with Mérouane Debbah, NEWCOM and Eurécom Institute, Sophia Antipolis, France for a special issue on "Space-Time Channel Modelling for Wireless Communications" in the EURASIP Journal on Wireless Communications and Networking. Deadline for submissions is 1st April 2006 (no kidding).

Congratulations

Professor Alex Grant, Unisa has been elected to a three year term on the Board of Governors of the Institute of Electrical and Electronics Engineers (IEEE) Information Theory Society. This is a prestigious position in a technical society of the world's largest professional electrical engineering body, and recognises Alex's profile in the international Information Theory community.

New Appointment

Dr. Nick Letzepis has joined the Institute for Telecommunications, University of South Australia as a Research Fellow following his graduation from UniSA.

Nick will be working with Prof. Bill Cowley on "A Study of High-Rate Free-Space Optical Links for the ADF". and with Prof. Alex Grant on the ARC Discovery Grant "Information Theory for Networks with Uncertain Topologies". We wish Nick the best of luck in his new position at ITR.

New Appointment

Dr. Laura Cottatellucci has joined the Institute for Telecommunications, University of South Australia as a Research Fellow.

Laura graduated from the Technical University in Vienna, Austria, after which she held a position as a Post Doctoral Fellowship on Ad-Hoc Networks at the Institut National de Recherche en Informatique et en Automatique (INRIA), France.

Laura will be working with Prof. Alex Grant on the ARC Discovery Grant "Information Theory for Networks with Uncertain Topologies". We wish Laura the best of luck in her new position at ITR.

Successful ARC Discovery Grants 2006-2008

Six ACoRN members were successful with their ARC Discovery Grant applications. Congratulations to the following members:

A/Prof. Subhrakanti Dey and A/Prof. Jamie Evans (University of Melbourne) for their joint project together with Dr. G. N. Nair, entitled "Distributed Estimation and Control under Communication Constraints".

Dr. Jinhong Yuan (University of New South Wales) for his project entitled "Design of MIMO spatial division multiple access techniques for multi-user wireless data services".

Dr. Sarah Johnson (University of Newcastle) for her project entitled "Construction methods and analysis tools for repeat-accumulate error correction codes".

Prof. Lars K. Rasmussen and Prof. Alex Grant (University of South Australia) for their project entitled "Complexity constrained iterative information processing".

Apologies if we did not manage to mention all successful grant winners from ACoRN. Please notify us of any omissions, so they can be included in the next newsletter.

Opportunities

University of South Australia

Research Fellow/
Senior Research Fellow
Institute for Telecommunications Research

2 Positions

Established in 1994, The Institute for Telecommunications Research (ITR) is one of Australia's premier research organisations in the area of wireless telecommunications. Its focus is on coding and information theory, communications signal processing and wireless networks for a variety of satellite and terrestrial applications.

We are currently seeking to fill **up to 2 positions** to work on two Australian Research Council (ARC) Discovery Grants.

- Information Theory for Networks with Uncertain Topology (1 position)
- Complexity constrained iterative information processing (1 position)

The Research Fellows will be required to have a PhD, or have submitted their thesis for examination in Telecommunications, Mathematics or a closely related discipline. Research experience is required in the areas of:

- Multiuser information theory and/or network coding, or
- Iterative information processing and/or concatenated coding and iterative decoding.

Selection for these positions will be based on applicants addressing specified selection criteria. More information can be found on the ITR website shortly under "vacancies": http://www.itr.unisa.edu.au/

or alternatively, contact Ms Amanda Johnston on
phone: +61 8 8302 3769
email: amanda.johnston@unisa.edu.au

Call for Papers

Due Date	Event Name
Feb 13 06	IEEE VTC 2006 - Fall http://www.vtc2006fall.org
March 1 06	PIMRC 2006 http://pimrc2006@ee.oulu.fi
March 31 06	ACOFT – 10-13 July 2006 http://www.acoft.com.au
April 1 06	Special Issue of the EURASIP Journal on Wireless Communications and Networking on Space-Time Channel Modeling for Wireless Communications. http://www.hindawi.com/journals/wcn/si/stc
June 1 06	IEEE Information Theory Workshop, Chengdu, China, Oct 22-26, 2006 http://www.ee.cityu.edu.hk/~itw06/,
June 1 06	A special issue of IEEE Journal on Selected Areas in Communications is being organized on: Optimization of MIMO Transceivers for Realistic Communication Networks: Challenges and Opportunities. http://www.argreenhouse.com/society/J-SAC/Calls/mimo_transceivers.html

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

Coming Events

Event Date	Event Name
30 Jan – 3 Feb 06	Mathematical aspects of high performance codes_
31 Jan 06	Introduction to Internet Engineering
1-3 Feb 06	Australian Communications Theory Workshop
9-10 Feb 06	Postgraduate Workshop on Systems, Signals & Controls
13-16 Mar 06	AusWireless 2006
4 -5 May 06	MIMO from Theory to Practice
7–10 May -06	ICASSP
11-15 June 06	ICC 2006 Wireless Communications
10-13 July 06	ACOFT
14 July 06	OFDM workshop
20-21 July 06	Wireless NetWork Workshop

For a complete list of coming events, or reports on past events, see the event calendar.

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.com.au