Welcome to the first edition of Platform Technologies News, the quarterly newsletter of the Platform Technologies Institute.

Platform Technologies News provides regular updates on achievements of, and events in and around the Institute. On this occasion, I would like to thank Petra Van Nieuwenhoven for her tireless efforts in pulling all the information together and lifting this first edition, in particular, over the bar.

Comings and goings

As you are aware, our Director, Professor Xinghuo Yu is on research leave until the end of February and during his absence I have been appointed as Acting Director, with Professor Mike Austin taking the reins from December 2009 to end of February 2010. It has been a busy time for all of us and on behalf of the Institute I would like to congratulate all our members on their recent grant successes.

Congratulations to Associate Professor Jinhu Lu from the Chinese Academy of Sciences, who has been awarded an ARC Future Fellowship for a project titled Modelling, Identification and Control of Complex Networks to be administered by RMIT. Assoc Prof Lu has an outstanding research track record with his research works being cited over 2100 times with h-index 27 according to ISI-Web of Science. He will be working with Professor Xinghuo Yu and collaborating with Professor David Hill, a Federation fellow at ANU.

Welcome to Dr Stephen Davis who commenced on 14 October as a Tenure Track Fellow in Security and Safety lead by Professor Kathy Horadam.

Welcome also to Dr Selvakannan Periasamy who has been appointed as a Postdoctoral Fellow and his project will be linked with Nano Materials and Devices.

Unfortunately Dr James Partridge has resigned from his position as a Postdoctoral Fellow in Nano Materials Devices to return to New Zealand; we wish him well in his future endeavours. Dr Abu Zafar Md Sadek has been appointed to take over James’ role within the project team.

Member awards

It is with much pleasure that I note that the following researchers have received RMIT’s 2009 Teaching Awards:

- Professor Jiyuan Tu received the award in the category Physical Sciences and related studies for excellence in developing innovative approaches, multidisciplinary collaboration and achieving international recognition in teaching Thermal Fluid Science and Computational Fluid Dynamics
- Associate Professor Adela McMurray received the award in the category Early Career Academic for outstanding contributions to education and students’ learning through innovative and engaging activities based on student centred reflective practice across courses and programs in the School of Education.

Christmas celebration

A Christmas celebration will be organised early December and I look forward to catching up with you all then.

I trust you will find the publication useful and informative. Any feedback or suggestions about its contents are welcome and if there is a particular topic you would like covered, please let us know. In future issues we plan to feature selected projects and people. We invite suggestions.

Warm regards,

Professor Heinrich Schmidt
Acting Director

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Conference

PTRI 2009 Annual Symposium

PTRI hosted its successful 2009 Annual Symposium on 14 and 15 July 2009 at the RMIT Kaleide Theatre. The first day focused on an overview of what the four programs in Platform Technologies Research Institute had achieved since its inception, the challenges and the way forward for excellence in research.

In addition, discussions and presentations focused on how multidisciplinary collaborative links and initiatives across the four RMIT Research Institutes can support leading edge research through the effective coordination and integration of diverse research activities and research results.

The afternoon was dedicated to panel discussions between the audience, leading researchers and industry experts on nanotoxicology and nanosafety issues.

The second day of the symposium was dedicated to identifying significant external research and development opportunities in national priority areas such as smart energy, green car, information security and nanotechnology.

Internal and External keynote speakers included:

- Professor Arun Sharma (pictured), Deputy Vice Chancellor, Research/Commercialisation, QUT on Research and Innovation in Australia.
- Professor Suresh Bhargava, Dean, School of Applied Sciences, RMIT University on The Midas Touch – Forget Goldfinger… here comes the golden nose
- Mr Terry Jones, Director, CSIRO Centre for Distributed Energy and Power on Smart Energy
- Professor Hussein A. Abbass, Defence and Security Applications Research Centre, UNSW@ADFA on Computational Red Teaming and Cyber Challenges
- Dr Laurie Sparke OAM, L Sparke Pty Ltd on Challenges and Opportunities in Green Car Technologies

Thank you to all staff who supported the Symposium by way of presentations and their attendance.

Recordings and copies of presentations are available from the PTRI events web site www.rmit.edu.au/research/institutes/platformtechnologies/news/

4th Asia Pacific Congress on Sports Technology – APCST 2009

In collaboration with the Japan Sports Engineering Association (JSEA) and the Australasian Sports Technology Alliance (ASTA) and with the support of the International Sports Engineering Association (ISEA), RMIT organised the international biannual 4th Asia-Pacific Congress on Sports Technology which was held from 21 to 23 September at the Hyatt Regency Waikiki Beach Resort and Spa in Hawaii, USA.

The congress provides an international forum for scientists, engineers and educators from around the world and who are involved in sports technology research, development and innovation. It also aims to actively engage with the sporting goods industry through an industry exposition and specialist industry workshops.

Participants were provided with an opportunity to present and discuss the latest trends and findings and to learn about the state-of-the-art in their particular field(s) of interest. A broad range of topics and application areas reflected the interdisciplinary nature of this congress.

IEEE International Conference on Fuzzy Systems and Knowledge Discovery

Professor Hepu Deng was Co-Chair at the IEEE International Conference on Fuzzy Systems and Knowledge Discovery, August 16-18, 2009, Tianjing, China.

12th International ACM SIGSOFT Symposium on Component-Based Software Engineering (CBSE 2009), June 2009, East Stroudsburg, PA, USA

The theme of the conference this year was Components for Large-Scale Systems of Systems and Ultra-Large Systems. Like in previous years, the symposium brought together academics and practitioners in the area of component software, and this year in the serene Pocomo Mountains west of New York. Conference tracks ranged from Applications, Component Integration, Communication and Composition to Extra-Functional Analysis of system-level properties. The recipe for attracting industry even to the last Friday session and to praising the conference has worked for a few years: an industrial day in the middle of the conference with industry-focused keynote and some industry-centred research papers; all sessions throughout the conference spending their second half as a working session on the theme of the papers presented. Thus seasoned experts and young researchers alike get sufficient time to delve into interesting details of the previous few presentations, make connections, talk about work in progress and future challenges and trends.

CBSE 2009 is a longstanding and A-ranked conference. It was co-organised by Prof. Schmidt and held as the lead conference during the COMPARCH (Federated Events on Component-Based Software Engineering and Software Architecture) week. This year QoSA 2009 (Quality of Software Systems and Architecture) and WCOP (Workshop on Component-Oriented Programming) joined the COMPARCH week. The proceedings of CBSE 2009 are published in the Springer Lecture Notes in Computer Science as LNCS 5582.
External links/collaborations

PTRI is committed to enhancing RMIT’s competitive research profile and strengths in platform technologies and engaging in international technological research in its multidisciplinary domain.

To achieve this, researchers are encouraged to establish relationship with external partners. Consequently it was great to hear of the following external collaborations:

On 3 July Professor Suresh Bhargava was admitted as a Fellow of Royal Society of Chemistry, London.

In September 2009, Professor Xinghuo Yu received a Chang Jiang (Chinese name for Yangtze River) Scholar award from the Ministry of Education of China. The Chang Jiang Scholar is a most prestigious award established by the Ministry of Education of China and Li Ka-Shing Foundation (Hong Kong) to acknowledge outstanding contributions made by Chinese scientists and overseas scholars in various research fields. By this award, Professor Yu has been appointed as a Chang Jiang Endowed Chair Professor (visiting) at South-East University, Nanjing, China, one of the major research universities in China, where he will make regular short term visits over the next three years.

Professor Xinghuo Yu represented RMIT at the Workshop for Developing the Australian Smart Grid R&D Roadmap held on 12 August. The workshop was hosted by the Smart Grid Australia (SGA) Research Working Group and CSIRO and its aim was to develop the Australian Smart Grid R&D Roadmap towards a future where Smart Grids are successfully implemented in Australia, benefitting government, the industry, the environment and the general public. Professor Yu has been invited to join the Research Workgroup as a member.

Dr Anthony O’Mullane and Professor Suresh Bhargava have an established collaboration in place with CSIRO – Energy Technology and as part of the CSIRO Energy Transformed Flagship program CSIRO are offering two PhD scholarship opportunities to suitably qualified honours students. The projects will be conducted in the following areas:

» Designing super ionic liquids to survive extreme electrochemical and thermal conditions for use in the new high temperature applications.

» Novel, high charge capacity conducting polymers based on polyaniline grown in protic ionic liquids for advanced energy storage applications.

Further information on this scheme can be found at www.csiro.au/partnerships/ETF-Postgrad-Scholarships.html

Professor Liuping Wang will lead a project in collaboration with key industry participant Australian Numerical Controls and Automation Pty Ltd (ANCA) on manufacturing control systems Nanotechnology Now. This work has also been highlighted by as part of a Advanced Manufacturing Cooperative Research Centre Centre grant. It is a two year $1.1 million project with future ANCA research projects anticipated in the areas of computer and software architecture as well as intelligent diagnosis and prognosis.

RMIT University and Alcoa Australia have signed a Memorandum of Understanding, formalising a further three years of an innovative industry-based learning initiative in Western Australia.

Mercury sensing work has been highlighted on the world wide web on sites such as Sciencealert, AZo Nanotechnology, Nanowerk, Nanotechnology and development news, Gold Bulletin on its Gold Innovations website and a contribution to the AZo Nanotechnology “Thought leaders” program was recently posted.

There is a distinct possibility of collaboration with an Indian Electrochemistry group led by Professor Suresh Aggarwal based at Homi Bhabha National Institute (HBNI) on the electrochemical synthesis of nanomaterials in ionic liquids with electrocatalytic properties. Professor Bhargava will visit Professor Aggarwal during Dec 09 to finalise this collaboration.

Professor Sati Bhattacharya announced that, following licensing agreement with RMIT, Aron Universal has started commercialising the production of the nanopigment PNP98. In addition, a new technique has recently been developed to simplify the production of nanoparticles. One of the products is currently being characterised for its properties and performance.

Professor Suresh Bhargava has been recognised by industry for his commitment and leadership in the area of safety and the environment by winning the Worley Parsons Award at the 2009 Chemeca Conference in Perth. Professor Bhargava is the first academic in Australia to receive the coveted award for his innovative solutions to industrial problems.

Publications

Journal articles

One of the five indicators of research performance is publications. RMIT’s Business Plan 2009-2011 has set an increase in weighted publications by 3% per annum to 2011. Consequently, the following is good news on the publications front; congratulations are in order for all researchers who were successful in their submissions of journal articles, book chapters, conference papers and citations in the third quarter of 2009- in particular the following researchers:

Feature article on ‘Using Nanotechnology to Measure Mercury’ by Professor Suresh Bhargava in the “The NanoExperts Series” section of The A to Z of Nanotechnology, the leading online Nanotechnology destination for news, articles and The Online Journal of Nanotechnology www.azonano.com Dalton Transactions
Hot Article on “Synthesis and Interconversions of Digold (I), Tetragold (II), Gold (I)-Gold(III) and Digold (III) Complexes of Fluorine-substituted Aryl Carbanions” by Professor Suresh Bhargava in the Hot Articles section of the Royal Society of Chemistry, Thomas Graham House Journal at www.rsc.org/Publishing/Journals/dt/HotArticles.asp on 27 July 2009.

Professor Xinghuo Yu was invited to write a survey paper entitled “ Sliding Mode Control with Soft Computing: A Survey” which was published in the 2009 September Issue of the IEEE Transactions on Industrial Electronics.

Dr Arathi Arakala, Dr Jason Jeffers and Professor Kathy Horadam have been cited in the Handbook of Fingerprint Recognition (Springer) 2009 edition, in the chapter Securing Fingerprint Systems.
The following publications are from nanoscience and nanotechnology project teams:


The following publications are part of the project on Development and Application of Nanostructured Functional Materials:

- Parmar, H B., Gupta, R. K., Bhattacharya, S. N. (2008), Rheological and molecular properties of organic peroxide induced long chain branching of recycled and virgin high density polyethylene resin, Polymer Engineering and Science, 49 (9), 1806-1813.

Other publications for this quarter include:

- Ivanova, Elena; Truong, Vi Khanh; Wang, James; Bendt, Christopher; Jones, Robert; Schmidt, Heinz; Yusuf, Iman; Peake, Ian; Fluke, Christofer; Barnes, David; Crawford, Russell. Impact of nanoscale roughness of titanium thin films surfaces on bacterial retention. Langmuir. (American Chemical Society). Published online on October 20, 2009.


Pengfei Han, Xiuzhen Zhang, Raymond S. Norton & Zhi-Ping Feng, Large-Scale Prediction of Long Disordered Regions in Proteins Using Random Forests, BMC Bioinformatics.


Antony W. Iorio & Xiaodong Li, Improving the performance and scalability of Differential Evolution on problems exhibiting parameter interactions, Soft Computing Journal (Special Issue on Genetic Fuzzy Systems).


Xuan Dau Hoang, Jiankun Hu & Peter Bertok, A program-based anomaly intrusion detection scheme using multiple detection engines and fuzzy inference, Journal of Network and Computer Applications.

Jiankun Hu, Xinghuo Yu, D. Qiu & Hsiao-Hwa Chen, A Simple and Efficient Hidden Markov Model Scheme for Host-Based Anomaly Intrusion Detection, IEEE Network.

Fahim Sufi, Qiang Fang, Ibrahim Khalil & Seedahmed S. Mahmoud, Novel Methods of Faster Cardiovascular Diagnosis in Wireless Telecardiology,IEEE Journal on Selected Areas in Communications.


Ibrahim Khalil & Fahim Sufi, Cooperative Remote Video Consultation on Demand for e-Patients,Journal of Medical Systems.

Book chapters


Book chapters
J. Hu, Springer Handbook on Communication and Information Security, Host-Based Anomaly IDS.
Stefan Bird & Xiaodong Li, Computational Intelligence in Expensive Optimization Problems, Improving Local Convergence in Particle Swarms by Fitness Approximation Using Regression.

Conference papers
Professor Sati Bhattacharya presented at the Chemeca 2009 Conference in September.
Upali K. Wickramasinghe & Xiaodong Li, Using a Distance Metric to Guide PSO Algorithms for Many-Objective Optimization, Genetic and Evolutionary Computation Conference (GECCO 2009), Montreal, Canada. 8-12 July 2009.
Martin Jahne, Xiaodong Li & Jurgen Branke, Evolutionary Algorithms and Multi-Objectiveization for the Travelling Salesman Problem, Genetic and Evolutionary Computation Conference (GECCO 2009), Montreal, Canada. 8-12 July 2009.
Falk Scholer & Andrew Turpin, Metric and Relevance Mismatch in Retrieval Evaluation, 5th Asia Information Retrieval Symposium (AIRS 2009), Sapporo, Japan. 21-23 October 2009.

Grants
RMIT aspires to be ranked in the top 15 universities nationally in terms of total research income and in recent years placed a greater focus on obtaining Category 1/ Australian Competitive Grants which include ARC Discovery grants and ARC Linkage Grants.
RMIT’s target is to increase competitive grant income by 15% per annum to 2011. PTRI is committed to contribute to this projected target performance and it was pleasing to note the recent result of RMIT’s performance in the ARC Discovery and ARC Linkage schemes.
Congratulations to all the researchers who were successful with the following ARC discovery and ARC linkage project proposals and RMIT Early Researcher Grant Scheme:

**ARC Discovery**

Dr John Mo and Dr Peter Daivis each received the RMIT Early Researcher Grant of $20,000.

A/Prof Andrew Turpin, Dr Allison McKendrick on Designing novel silicon photonic devices harnessing new leakage behaviour, 2010-2013, $300,000.

Prof Lin Padgham on An extensible agent-based framework for exploring climate change adaptation, 2010-2012, $290,000.

Prof Lin Padgham, Dr S Sardina, Dr John R Thangarajah on Intent selection in intelligent agent systems, 2010-2012, $275,000.

**ARC Linkage**

A/Prof A Mitchell, Dr TG Nguyen, Prof T Koch on Novel silicon photonic platform for quantum encryption and communications, 2010-2012, $279,215.

Dr Anthony O’Mullane and Professor Prof Zahir Tari, A/Prof Jiankun Hu, Dr Abdun Mahmood on Designing distributed intrusion detection systems for critical industrial infrastructures, 2010-2012, $250,000.

A/Prof Andrew Turpin, Dr Allison Kendrick on Smart algorithms for visual field assessment. 2010-2012, $151,538.

Prof Lin Padgham, Dr John R Thangarajah, Dr Timothy Miller on Integrating and automating testing in multi-agent system development, 2010-2012, $230,000.

**Internal grant schemes**

RMIT is proud to offer an internal grant scheme for research development and innovations through the academic plan. The following researchers were amongst the many 2009 grant recipients:

Dr Fenglin Han and Dr Abdun Mahmood each received a RMIT Early Researcher Grant of $20,000.

Dr John Mo and Dr Peter Daivis each received the RMIT Research Leave Award.

**Research seminars**

PTRI is committed to encouraging collaboration between researchers across RMIT, researchers from national and international institutions and industry. Thank you those of you who organised the following research seminars:

10 July - Associate Professor Kourosh Kalantar hosted a seminar presentation by visiting Professor Zheng Hu from Key Laboratory of Mesoscopic Chemistry of MOE at Nanjing University on ‘Growth and Properties: Carbon Based Nanotubes and One-Dimensional AIN’.

27 July - Dr Rahul Gupta hosted a seminar presented by Professor Hyoung Jin Choi from Inha University (Korea) on ‘Electronic Paper: New Type of Display and Paper’.

14 August - Professor Liuping Wang hosted a seminar presented by Professor Eric Rogers from the School of Electronics and Computer Science at the University of Southampton, UK on ‘Rehabilitation Robotics: Iterative Control Algorithms with Clinical Trial Results’.

25 August - Dr Vipul Bansal hosted a seminar presented by Professor Mitsuo Umezu from the Centre for Advanced Biomedical Sciences – Tokyo Women’s Medical University-Waseda University University Joint Institution, Professor Umezu’s talk focused on the ‘Next Generation of New Medical Treatments – Engineering Based Medicine’.

14 October - Professor Cees Bil hosted a seminar presented by George T.Schmidt, Editor-in-Chief of the American Institute of Aeronautics and Astronautics (AIAA) Journal of Guidance, Control and Dynamics. The presentation focused on ‘Global Positioning System and Inertial Sensor Technology Trends for highly integrated platform navigation systems.

**Miscellaneous news: RMIT Technologies in World Ranking Top 100**

RMIT was recently ranked #97 in the World, #7 in Australia and #1 in the ATN in the 2009 Engineering and Information Technology University Ranking by the UK Times Higher Education Supplement (HES). Since the Platform Technologies Research Institute represents the weight of RMIT technologies disciplines, it is with great pleasure that I congratulate all members, associates and the wider technology-focused community in RMIT. Well done! Let’s also improve our ranking in the more recognised and research-focused Shanghai Jiao Tong (SJT) University ranking. Unlike the SJT ranking, HES gives more weight to international reputation by the number of international peers, students and staff who hold RMIT in high regard than JSC and puts less weight on the financial standing which, in JSC is considered an important proxy for freedom of strategic research direction and likely continuation of research strength. It is interesting to note that HES is poised to outsource its citations analysis to ISI Thomson for future rankings.

The Australian universities in the Top 100 in the HES Technologies ranking are Uni Melbourne (29), UNSW (33), Uni Sydney (40), ANU (42), Monash Uni (50), Uni Queensland (61) and RMIT Uni (97).
Research support news

Check out the latest developments in research administration @ R&I and PTRI:

PTRI administration are currently working on consolidating the reporting process of the research performance of all researchers associated with PTRI. To ensure that all outcomes are included, all researchers are reminded that there are processes that all RMIT researchers should follow, when applying for funding, so that this information is captured: www.rmit.edu.au/browse;ID=jg30k3i1c6l (see: How to apply for grants and funding and After the funding has been awarded). If you have any questions regarding this process, please contact the Research Support Unit.

Check out the new web page that has been developed to identify resources for College researchers seeking funding for their work. This may be accessed via the College of Science Engineering and Health home page, select Research, then Research Initiatives and the Research Grant resources link at the bottom of the page, or from the link below: www.rmit.edu.au/browse;ID=kt37xzmqkrx1 The page contains support for grant applicants and links to the central University Research Support Unit and funding body web pages.

Upcoming research seminars

10 November—Ambient Spatial Intelligence for Bushfire Science, an interdisciplinary workshop at the Melbourne Engineering Research Institute (MERIT Annual Symposium. Keynote speakers include Mark Garvey (CFA), Andrew Matthews (DSE), Kevin Tolhurst (UniMelb). For more information contact Theoni Sklavos tsklovas@unimelb.edu.au or Matt Duckham matt@duckham.org

7 December—Professor Liuping Wang will host a workshop in celebration of Professor Peter Young’s 70th birthday and his research contributions to Identification, Environmental Modelling and Control.

15 December—Professor Liuping Wang will host a Model Predictive Control: Design and Implementation Using MATLAB® at an international conference in Shanghai.

Further information on these events is available from the PTRI events website www.rmit.edu.au/research/institutes/platformtechnologies/news/