



**The 8<sup>th</sup> Annual PostGraduate Symposium**  
**on**  
**The Convergence of Telecommunications,**  
**Networking and Broadcasting**

28-29 June 2007

PETER JOST ENTERPRISE CENTRE  
Liverpool John Moores University  
Liverpool, U.K.

# PROGRAMME

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Welcome to our 8<sup>th</sup> annual gathering of PGNet. We are very pleased to see that our research community is again strongly represented with 78 papers from around all corners of the UK.

PGNet is an initiative, sponsored by the EPSRC and supported by key industrial and academic players in the fields of telecommunications, data networking and broadcasting. The aim is to create a forum for UK based postgraduate students, to enable the exchange of ideas and experiences. The gathering, which has now established itself as an annual fixture, includes conference presentations and workshops. This will provide the much needed training and preparation for the future. PGNet 2007 will also be attended by well known researchers, industrialists and broadcasters in these areas and therefore will provide the crucial feedback mechanisms required for the development of research and young researchers. An important benefit that accrues out of such a gathering is the cross fertilisation between the different disciplines and mix of experiences and interests that will lead to the development of a “network of people”.

The communication infrastructure of the 21st century will continue to rely on a mix of wired and wireless systems. Communications researchers will confront and solve a set of technical challenges to provide adequate bandwidth and data rates for the ever-growing numbers of subscribers; customers will continue to demand new services for global communications which will require more bandwidth and higher speed. The continuing advances in wireless telecommunication technologies, sensor networks, networked appliances, home networking, distributed, mobile, ubiquitous and pervasive computing, and heterogeneous networking will have a major impact on our future environments, be it the office, factory, city or home. These advances have been reflected in this year’s technical programme. In the social realm, the Internet and wireless telephony have jointly demonstrated that communication is both a basic human need and an indispensable part of modern society. These developments provide many exciting opportunities for business and commerce and a number of technical and social challenges. Some of these challenges include access and usability for all as well as ensuring safety and privacy in a world of always connected systems and people.

On behalf of the steering committee, I would like to thank our sponsors for their generous support, the keynote speakers and session chairs for their time and effort, and the authors for their contribution to an excellent programme.

Finally, I would like to thank my colleagues in the local organising committee for all their hard work in helping to make this event a success.

We hope you enjoy PGNet 2007 and have a great time in Liverpool. The European Capital of Culture 2008.

**Madjid Merabti**

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## KEYNOTE SPEECH

### The Future of the Automobile and the Roads they Travel on

Prof. Dave Marples  
Chief Scientist, Technolution B.V.

Dave Marples is Chief Scientist of Technolution B.V., an employee owned company in the high tech and Intelligent Transport Systems markets based in Gouda, The Netherlands. Marples current interests are in Intelligent Transport Systems for the UK and European markets - making better use of the scarce resource of our precious transport infrastructures.

Previously he was Chief Scientist in the Network Systems Research Lab at US-headquartered Telcordia Technologies where he worked since 1999, apart from a spell with Global Inventures Incorporated where he was responsible for the management of the Open Services Gateway Initiative (OSGi). At Telcordia he was responsible for the development of the Networked Appliance research program and he established Telcordias automotive practice, with a focus in the areas



of vehicle telematics and automotive prognostics and diagnostics. He was the Chief Architect of the European Union Global System for Telematics (GST) project and has worked extensively with automotive OEMs on Prognostics and Diagnostics initiatives.

Marples' formal training is in electronics and communications engineering and he has B.Eng (Hons.) and M.Eng degrees from Bradford University, England. His Ph.D. is from Strathclyde University, Scotland. He is an Industrial Fellow of the Royal Commission for the Exhibition of 1851 and a Fellow of the OSGiA. He is Honorary Professor of Communications at Stirling University, Scotland.



**DAY 1 – THURSDAY 28<sup>TH</sup> JUNE 2007**

<b>REGISTRATION</b>	<b>09:30 – 12:00</b>
<b>LUNCH</b>	<b>12:00 – 13:00</b>
<b>WELCOME SPEECHES</b>	
Prof. Madjid Merabti, <i>Liverpool John Moores University</i> Prof. Diane Meehan, <i>Liverpool John Moores University</i>	<b>13:00 – 13:10</b>
<b>KEYNOTE SPEECH</b> (Session Chair – Prof. David Hutchison, Lancaster University) <i>Main Lecture Theatre</i>	
Prof. Dave Marples, <i>Chief Scientist, Technolution B.V.</i> “The Future of the Automobile and the Roads they Travel on”	<b>13:10 – 14:10</b>
<b>SESSION 1A – WIRELESS SENSOR NETWORKS I</b> (Session Chair – Dr. David Llewellyn Jones, Liverpool John Moores University) <i>Main Lecture Theatre</i>	
Using a Genetic Algorithm to Optimize the Performance of a Wireless Sensor Network Fan, J., Parish, D., <i>Loughborough University</i> Security in Mobile Wireless Sensor Networks Kifayat, K., Merabti, M., Shi, Q., Llewellyn-Jones, D., <i>Liverpool John Moores University</i> A Survey of Transmission Power Control in Wireless Sensor Networks Khemapech, I., Miller, A., Duncan, I., <i>University of St Andrews</i> Aggregation Service in Middleware for Wireless Sensor Network Javed, H., Merabti, M., Askwith, B., <i>Liverpool John Moores University</i> Policy, Prediction and Adaptation in a WSN Sturgeon, T., Allison, C., Miller, A., <i>University of St Andrews</i>	
<b>SESSION 1B – DISTRIBUTED AND MOBILE COMPUTING I</b> (Session Chair – Dr. Anirach Mingkhwan, King Mongkut's Institute of Technology North Bangkok, Thailand) <i>Conference Room A</i>	
MemoryLane: A Mobile Companion for Ageing Users Mc Carthy, S., Sayers, H., Mc Kevitt, P., McTear, M., <i>University of Ulster</i> Mixed Mobile and Fixed Transactions Scheduling in Mobile Computing Environment Alqerem, A., Hussak, W., <i>Loughborough University</i> HSDPA Wireless Broadband Link Performance Sedoyeka, E., Almasri, S., Rahman, A., Hunaiti, Z., <i>Anglia Ruskin University</i> Ubiquitous, Flexible and Distributed Computing Zhang, J., Phillips, C., <i>Queen Mary, University of London</i> Diversity of Grid Traffic: A Survey-based Study El khatib, Y., Edwards, C., <i>Lancaster University</i>	
<b>SESSION 1C – OPTICAL NETWORKING</b> (Session Chair – Dr. Steven Hill, University of Salford) <i>Conference Room B</i>	<b>14:20 – 16:00</b>
Simulation of an All-Optical 1 × 2 SMZ Switch with a High Contrast Ratio Chiang, M., Ghassemlooy, Z., Ng, W., Minh, H., <i>Northumbria University</i> Dynamic Routing and Wavelength Assignment using Hybrid Particle Swarm Optimization for WDM Networks Hassan, A., Phillips, C., Pitts, J., <i>Queen Mary, University of London</i> Performance of Subcarrier Modulated Free-Space Optical Communications Popoola, W., Ghassemlooy, Z., Allen, J., <i>Northumbria University</i> Performance Analysis of Optical CDMA Systems with PPM Signalling Cui, K., Leeson, M., Hines, E., <i>University of Warwick</i> Performance of OOK with ANN Equalization in Indoor Optical Wireless Communication System Rajbhandari, S., Ghassemlooy, Z., Angelova, M., <i>Northumbria University</i>	
<b>SESSION 1D – AD HOC NETWORKING I</b> (Session Chair – John Mellor, University of Bradford) <i>Conference Room C</i>	
A DSDV-based Multipath Routing Protocol for Mobile Ad-Hoc Networks King, P., Etorban, A., Ibrahim, I., <i>Heriot Watt University</i> Context Driven Ad-Hoc Networks Liu, Q., Linge, N., <i>University of Salford</i> TL-ERS: A Traffic Locality Based Expanding Ring Search for MANETs Al-Rodhaan, M., Mackenzie, L., Ould-Khaoua, M., <i>University of Glasgow</i> An Evaluation of Segregate Networks Compared to GRID Technology Paraskelidis, A., Adda, M., <i>University of Portsmouth</i> Route Maintenance in Wireless Ad Hoc Networks Saeed, M. J., Merabti, M., Askwith, R. J., <i>Liverpool John Moores University</i>	
<b>COFFEE BREAK</b>	<b>16:00 – 16:10</b>

<p align="center"><b>SESSION 2A – NETWORKED APPLIANCES AND MULTIMEDIA APPLICATIONS</b> (Session Chair – Dr. Paul Fergus, Liverpool John Moores University) <i>Main Lecture Theatre</i></p>	
<p>A Virtual Networked Appliance using Automatic Service Composition Namman, Ch., Mingkhwan, A., <i>King Mongkut's Institute of Technology North Bangkok, Thailand</i></p> <p>Generating 3D Multiplayer Game Maps from 2D Architectural Plans Summers, E., Getchell, K., Miller, A., Allison, C., <i>University of St Andrews</i></p> <p>Perceptually Optimised Variable Bilateral Filter for Low Bit-rate Video Coding Bhat, A., Richardson, I., Muir, L., <i>Robert Gordon University</i></p> <p>An Ad Hoc Gateway Service for Flexible Access to Networked Appliances Muhammad, A., Merabti, M., Askwith, B., <i>Liverpool John Moores University</i></p>	
<p align="center"><b>SESSION 2B – COMPUTER SECURITY</b> (Session Chair – Dr. Bob Askwith, Liverpool John Moores University) <i>Conference Room A</i></p>	
<p>Information Security: An Operational Risk Management Tool Kwaa-Aidoo, E., Cullen, A., Fretwell, R., <i>University of Bradford</i></p> <p>SPAM Prevention using Access Code (AC) Khalil, A., Parish, D., <i>Loughborough University</i></p> <p>Verification of Web Content Integrity: A new Approach to Protecting Servers against Tampering Aljawarneh, S., Laing, C., Vickers, P., <i>Northumbria University</i></p> <p>Finding Digital Evidence in Filesystem Events Khan, M., <i>University of Sussex</i></p>	
<p align="center"><b>SESSION 2C – SIMULATION AND MODELLING</b> (Session Chair – Prof. David Parish, Loughborough University) <i>Conference Room B</i></p>	<b>16:10 – 17:30</b>
<p>A Comparison of Models Designed using Different Kinds of Network Simulation Tools Rahman, M., Pakštas, A., <i>London Metropolitan University</i>; Wang, F., <i>Cranfield University</i></p> <p>tcpread: An Aid to Analysing tcpdump Traces Oliver, I., Miller, A., Allison, C., <i>University of St Andrews</i></p> <p>Developing Context and Location Aware Wireless Devices (CLAWD) Protocol in NS2 Cheng, P., Linge, N., <i>University of Salford</i></p> <p>Network Modelling and Simulation Tools Rahman, M., Pakštas, A., <i>London Metropolitan University</i>; Wang, F., <i>Cranfield University</i></p>	
<p align="center"><b>SESSION 2D – WIRELESS NETWORKING</b> (Session Chair – Dr. Alan Miller, University of St Andrews) <i>Conference Room C</i></p>	
<p>Coexistence Performance of Terrestrial Communication Systems with Area Optimized Channel Assignments Yang, M., Grace, D., <i>University of York</i></p> <p>Cooperative Communications for Cognitive Radio Networks Hamdi, K., Ben Letaief, K., <i>The Hong Kong University of Science and Technology, Hong Kong</i></p> <p>Gigabit Communication Links from a High Altitude Platform to Serve Specialist Users Peng, Z., Grace, D., <i>University of York</i></p> <p>Optimizing Performance of WIMAX Networks through Automated Site Selection Teterin, V., Hurley, S., Allen, S., <i>Cardiff University</i></p>	
<p align="center"><b>CONFERENCE TOUR AND DINNER</b> <b>Tour - Beatles Story Museum, Albert Docks</b> <b>Dinner - Pan American Bar and Restaurant, Britannia Pavilion</b></p>	<b>19:00 prompt</b>

**DAY 2 – FRIDAY 29<sup>TH</sup> JUNE 2007**

BREAKFAST	9:00 – 9:30
<b>SESSION 3A – AD HOC NETWORKING II</b> (Session Chair – Dr. Frank Ball, Bouremouth University) <i>Main Lecture Theatre</i>	
Performance Analysis of Dynamic Probabilistic Flooding in On-Demand Routing Protocols for MANETs Hanashi, A., Siddique, A., Awan, I. Woodward, M., <i>University of Bradford</i>  On-demand Partial-Disjoint Multipath Routing with Low Delay for Wireless Ad-hoc Networks Zafar, H., Harle, D., Andonovic, I., <i>University of Strathclyde</i> ; Ashraf, M., <i>Pakistan Telecommunication Company Limited, Pakistan</i>  The Effect of Node Density on Routing Protocol Performance in Mobile Ad-Hoc Networks Blakeway, S., Pullin, A., <i>Liverpool Hope University</i>  Optimizing the Threshold-Value for Counter-Based Broadcast Scheme in MANETs Mohammed, A., Ould-Khaoua, M., Mackenzie, L. M., Abdulai, J., <i>University of Glasgow</i> ; Jabaka, L. M., <i>Usmanu Danfodiyo University, Nigeria</i>  Bluetooth-based ad-hoc Networks Based on the Symbian OS Gao, F., Hope, M., <i>University of Salford</i>	
<b>SESSION 3B – WIRELESS COMMUNICATION THEORY</b> (Session Chair – Prof. Demetres Kouvatsos, University of Bradford) <i>Conference Room A</i>	
Comparison of Multi-Carrier CDMA and OFCDM in Fading Channel Ye, L., <i>University of York</i>  Analysis of a Twin-Class M-QAM Transmission System for Wireless Communications Abdurrhman, A., Woodward, M., <i>University of Bradford</i>  Time and Frequency Synchronization Techniques for OFDM Systems operating in Gaussian and Fading Channels: A Tutorial Wu, F., Abu-Rgheff, M., <i>University of Plymouth</i>  FPGA Based Dual Carrier Modulation Soft Mapper and Demapper for the MB-OFDM UWB Platform Yang, R., Sherratt, R., Cadenas, O., <i>University of Reading</i>  Understanding the Effects of Phase Noise and AWGN Channel in G-OFDM System Wirastuti, N., Noras, J., Jones, S., <i>University of Bradford</i>	9:30 – 11:10
<b>SESSION 3C – APPLICATIONS AND NETWORKING</b> (Session Chair – Tim Trew, NXP Semiconductors) <i>Conference Room B</i>	
Software Performance Engineering of Databases Osman, R., Awan, I., Woodward, M., <i>University of Bradford</i>  Sharing Human Life Memories using Peer-to-Peer Networking Ismail, A., Merabti, M., Llewellyn-Jones, D., <i>Liverpool John Moores University</i>  Interactivity in Deaf Classroom Using Centralised E-learning System in Jordan Khwaldeh, S., Matar, N., Hunaiti, Z., <i>Anglia Ruskin University</i>  An Adaptive Observation Framework for Self-Organising Networks of Autonomic Systems Lamb, D., Randles, M., Taleb-Bendiab, A., <i>Liverpool John Moores University</i>  Adaptive Unified E-learning System for Supporting Better E-Learning Approach Matar, N., Khwaldeh, S., Hunaiti, Z., <i>Anglia Ruskin University</i>	
COFFEE BREAK	11:10 – 11:20



<p align="center"><b>SESSION 5A – NETWORK SECURITY</b> (Session Chair – Dr. Irfan Awan, University of Bradford) <i>Main Lecture Theatre</i></p>	
<p>Analyzing the Behaviour of Network Attacks at a High Level using Case-based Reasoning Wang, X., De-Silva, M., Parish, D., <i>Loughborough University</i></p> <p>IPsec-based Multifence Secure Call Admission Control in Heterogeneous Networks Al-Haj, A., Mellor, J., Awan, I., <i>University of Bradford</i></p> <p>FloodDrop – SYN Flood Detection and Recovery Bigwood, G., Miller, A., Allison, C., <i>University of St Andrews</i></p> <p>Modelling Anomaly Based Network Intrusion Detection System Using Packet Header Protocols Shamsuddin, S., Woodward, M., <i>University of Bradford</i></p>	
<p align="center"><b>SESSION 5B – WIRELESS NETWORKING AND PROTOCOLS</b> (Session Chair – Dr. Haifa Takruri-Rizk, University of Salford) <i>Conference Room A</i></p>	
<p>A novel IPv4/IPv6 Transition Mechanism which Supports Transparent Connections AlJa'afreh, R., Mellor, J., Kamala, M., <i>University of Bradford</i>; Kasasbeh, B., <i>Applied Science University, Jordan</i>; Al-Ani, M., <i>Amman Arab University, Jordan</i></p> <p>Scalable Video/Image Transmission using Rate Compatible PUM Turbo Codes Fan, P., Oletu, G., Fagoonee, L., Stanković, V., <i>Lancaster University</i></p> <p>Analysis of Concatenation and Packing Mechanisms in IEEE 802.11n Skordoulis, D., Ni, Q., Ali, U., Hadjinicolaou, M., <i>Brunel University</i></p> <p>A Dynamic Medium Access Control Algorithm for IEEE 802.11 Wireless Local Area Networks Abu-Tair, M., Min, G., <i>University of Bradford</i></p>	<b>14:00 – 15:20</b>
<p align="center"><b>SESSION 5C – DISTRIBUTED AND MOBILE COMPUTING II</b> (Session Chair – Dr. Abdennour El-Rhalibi, Liverpool John Moores University) <i>Conference Room B</i></p>	
<p>Location-based Services Enhancement Using Zone-Based Update Mechanism Almasri, S., Sedoyeka, E., Alnabhan, M., Hunaiti, Z., <i>Anglia Ruskin University</i></p> <p>Comparison of the Performance of Handoff Scheme in IP Micro-Mobility Mansour, M., Mellor, J., Awan, I., <i>University of Bradford</i></p> <p>A Topology Aware Clustering Mechanism Tyson, G., Mauthe, A., <i>Lancaster University</i></p> <p>MoSReM: Mobile Scalable Recursive Multicast Protocol Albalas, F., Al-Begain, K., <i>University of Glamorgan</i></p>	
<b>COFFEE BREAK</b>	<b>15:20 – 15:30</b>
<p align="center"><b>CLOSING PANEL</b> (Panel Chair – Prof. Nigel Linge, University of Salford) <i>Main Lecture Theatre</i></p>	<b>15:30 – 16:30</b>

