Institution: University of Teesside

Unit of Assessment: UoA 15 – General Engineering

a. Overview The Technology Futures Institute (TFI) is the research Institute under which Engineering Research, Knowledge Transfer and Innovation are both managed and undertaken at the University. The TFI is home to the research activity of the School of Science and Engineering, its membership comprising some 75% of the School's Engineering academic staff, all research staff, and our ca. 57 research students, providing a research-focussed community, culture and support infrastructure. The Institute's research in the field of General Engineering is structured around three themes: Engineering Sustainability; Manufacturing and Process Engineering; and Analytical Instrumentation, Measurement and Control Engineering, being evolutions of themes established prior to RAE2008, to focus on the pursuit of research excellence.

b. Research strategy The TFI's research vision and strategy is summarised as follows:

- To facilitate internationally leading **applications focussed research** in the fields of Engineering Sustainability, Manufacturing and Process Engineering and Analytical Instrumentation, Measurement and Control Engineering through strategic partnerships, national and international research collaborations.
- To inspire and support a culture of research encouraging a team and partnership approach to all research activity, concentrating resources on the achievement of research excellence.
- To maximise the potential to achieve research impacts on business, the environment and society and to underpin the School's broader research-informed teaching activities.

Summary of achievements since RAE2008

The University's submission to RAE2008 identified three main research areas: Advanced Processing, Manufacturing and Design; Engineering Management; and Clean Technology and Environmental Engineering. The submission received 2.05 GPA with 25% 3*, 55% 2* and 20% 1* which represented substantial progress from RAE2001. These research activities continue. Moreover, the creation of the Technology Futures Institute (TFI) is part of a selective refocusing of the research strategy, to focus resources on the specific themes of manufacturing for the future, energy and environment as priorities in European and EPSRC research agendas. This has enabled the development of greater strength and depth in key research areas, including new research in areas such as ICT applied to energy efficiency in the built environment and intelligent control. These new research areas have attracted substantial funding and produced significant research outputs. Since RAE2008, TFI staff have:

- Spent over £4.1m of grant income.
- Secured over £4.0m of grant funding.
- Published over 350 publications, including more than 175 journal articles, 33 books/book chapters and 130 conference proceedings.
- Submitted 5 patents.
- Achieved 27.33 PhD completions.
- Hosted two international conferences: FAIM 2011 and CONVR 2013.

An area of relative weakness in the RAE2008 was the number of research student completions per FTE. In response to this, during the current REF period we have: introduced improved and more structured PhD research training through organised courses; established a seminar series in which PhD students discuss their research and share issues; and introduced more prescriptive PhD admission regulations. These have collectively resulted in an almost doubling in the numbers of PhD completions, with completion rates per FTE staff member more than doubled (2.10 per FTE in REF2014 compared to 0.96 in RAE2008). Average annual completion rate per FTE during the REF period was 0.42 compared to 0.15 in REA2008. The Graduate Research School at Teesside University contributes to this success through the central co-ordination of provision and support for PhD students and research active staff.

Significant specific successes against the targets identified in the 2008 submission include:

1. *Maintaining the impetus and direction of development established in recent years with an increasing focus on 'green' engineering.*

This was achieved by the development of our current Engineering Sustainability theme, securing substantial European research funding totalling £840,000 for Teesside to support collaborative international projects (total project funding of more than €5,400,000 across all partners) developing information technologies aimed at reducing energy use and carbon emissions associated with the

built environment.
2. *Further establishing partnership with world class process industries in the Teesside region.*
This has been achieved through partnership with the Centre for Process Innovation (CPI) - part of the High Value Manufacturing Catapult, and specifically through the secondment of Professor Graham Hillier (Chief Technology Officer for the High Value Manufacturing Catapult) as Professor of Sustainable Systems Engineering to lead a newly established (in 2013) research team at the University and facilitate research collaboration between CPI, Teesside University's TFI and the Institute for Manufacturing at the University of Cambridge focussing on Sustainable and Resource Efficient Manufacturing. This is expected to form a major complementary new area of activity linked to our existing sustainability research theme. N.B. as this was a long term secondment rather than internal staff appointment (deliberately to maximise the partnership opportunities it was designed to facilitate), Prof Hillier could not be included within the current submission – although this will be one of the centre-pieces of our research strategy going forward. The TFI also has strong, active research links with ABB, SABIC, Johnson Matthey and Lucite International, members of one of the EU's largest manufacturing hubs based in the Tees Valley.
3. *Develop " key areas of focus ... on catalytic conversion and synthesis of biogas"*.
This has been achieved through the joint research of Professors Olea and Hodgson and collaborations with the University of Tokyo, and "process monitoring for problematic biomass" through the continuing work of Zhang (also included as an impact case study).

c. People, including:

i. Staffing strategy and staff development

The University is one of the few in the UK to be awarded institution-wide Investors in People Gold accreditation, and is fully committed to providing equal opportunities and support to research and academic staff. All researchers are recruited using a standard, transparent recruitment process and justification for seeking fixed-term research appointments must be provided as part of the University's process for agreeing the creation of new posts, overseen by a regular committee.

The roles and responsibilities of research staff are clearly defined using the University's standard Job Description, and evaluated using the HERA job evaluation process. All new staff undertake an Initial Development Plan, reviewed at least annually to identify and monitor development needs and longer-term career priorities. The Department for Learning Development offers an Initial and Continuing Professional Development Programme (a wide range of workshops including project management, effective communication and managing/leading change), and the Graduate Research School provides a programme of training for researchers (covering research integrity, writing and presenting skills, and the use of bibliographic tools such as RefWorks). Researchers are encouraged to use Vitae's Researcher Development Framework (RDF) to reflect on their skills and training needs, and to discuss this with managers during development reviews.

The University has achieved considerable success in facilitating the progression of research staff through to permanent academic posts. Of the staff submitted in REF2014, one-third have progressed internally *via* this route. There are also clear routes for research progression for academic staff in post. Of the other staff submitted, one promotion to Professor (Olea) and two to Reader (Islam, Thompson) occurred during the REF period. Additionally, the University has a policy for the appointment of "new blood" early career researchers, with Kassem[1] and Hamad being in this category, and actively encourages visiting academics (see Section e)

Support is also offered to researchers approaching the end of a fixed-term project contract which will not be renewed, through the operation of a Redeployment and Pay Protection Policy; those who are "at risk" are given priority consideration for new vacant posts for a period of up to six months prior to the end of their contract. In addition, guidance from the University's Careers Service is available to researchers throughout their time at the University and for two years after they leave.

As outlined previously, the Technology Futures Institute provides the management infrastructure for research in the School. All staff appointment panels include a member of the TFI directorate and research potential and fit with our thematic priorities form an essential part of the staff recruitment and selection process. New staff appointees are supported to bid for research seed-corn funding through the University Research Fund to cover capital/startup costs, and are

[1] Kassem is the only submitted member of staff employed on a temporary contract (to 31st December 2013) for visa reasons.

provided with appropriate laboratory space within the School. A number of staff are also involved and supported in active collaborations with other institutions, for example Islam (Oxford and Cambridge), Olea (Tokyo), Dawood (Miyagi, Japan; Gyeongsang National University S. Korea), Ali (VTT) where this provides access to specialist facilities not available in-house.

The TFI Director is responsible for delivering the University and School research strategies and policies and is resourced to offer research secondments equivalent to around 5 full time staff equivalent annually (equivalent to circa £250k) to support existing academic staff and to develop further excellence in research. Staff submit an annual research plan as their TFI membership application (reviewed every 3 months in consultation with the TFI director) which includes their plans for research funding bids, production of journal and conference papers, and international collaborations and visits, etc. The TFI board assesses each of the submitted research plans and allocates research time (percentage of total academic workload) of between 10%-80% of total workload, with staff also receiving further automatic allocation for PhD research supervision (10% of workload per student).

Research students

All research students are automatically assigned the status of Associate Members of the TFI, to help establish them as part of an active research community and all TFI academic staff members are actively involved in supervising PhD students and research fellows. Office space in the form of "Research Villages" is provided to foster close relationships between research students, research fellows and academic staff, with staff offices being located in or close to research offices. Specific activities to promote research culture include:

- Effective PhD induction and supervision. All PhD students go through a common induction experience introducing them to the University and their School, and acquainting them with their role as research students. Each PhD programme is overseen by a Supervisory Team consisting of a Director of Studies and at least one, and usually two, additional supervisors, to ensure an appropriate mix of staff experience and to develop research supervision skills within the team. Meetings are held regularly between the student and the Supervisory Team, formally recorded, and monitored. Student progress is monitored and controlled through Annual Review and Progression Meetings.
- A suite of training for postgraduate research students is provided to support research practice. Induction and progression processes include an analysis of individual training needs which are provided in addition to compulsory research training.
- Advice on all policy, procedure and compliance issues, with a commitment to maintaining high ethical standards of research integrity and conduct, is provided to all researchers by the Graduate Research School.
- The TFI holds an annual research conference, at which students present their work alongside international invited speakers who give research presentations with relevance to a particular TFI research theme. These annual research conferences are attended by industry representatives and international visiting researchers, providing TFI members and research students the opportunity to present their on-going work in a professional conference environment.
- Teesside University Research Network's monthly meetings provide staff and students a forum to discuss the research agenda and headline issues, celebrate success and exchange ideas. External speakers of interest to the research community are invited to present at this event.
- The Postgraduate Research Forum is a monthly opportunity for PhD students to rehearse presentations and communicate their research, outputs and good supervision practices. The Forum provides research students with the opportunity to exchange ideas, share experiences and to learn of training and development opportunities of interest to early career researchers.
- A Postgraduate lounge is located centrally on campus, providing a space in which PG students can relax and meet informally, across disciplines. This dedicated lounge strengthens the PG community and provides a place of mutual support for PhD researchers.
- English language support for scientific writing for postgraduate research students and for researchers is provided, as required.
- Centrally, PhD-level research has been supported by the creation of 5 University PhD Studentships within TFI during the REF period.

d. Income, infrastructure and facilities

Income As outlined in Section b, in line with our strategy of focussing on industrial collaborative

and **applications-focussed research**, our primary target has been the securing of **Framework 7, TSB, EPSRC iCASE and direct Industrial funding** to support our research – targeting larger grants and collaborations with blue chip companies. We have been engaged in a rapid development of these activities, particularly toward the last two years of the REF period.

To put this into perspective, in comparative terms, our expenditure on European Community funded research in the last 2 years of the current REF period is greater than the total income achieved in the entire 6.5 years of the previous RAE period (£525,000) and sum to almost £1.3 million over the whole REF period, whilst funding from UK industry, Commerce and Public corporations has increased from £222,000 to approaching £1 million. Note that some caution is required in comparing "like with like" in the two returns as this potentially masks significant real growth in funding to support our research activity. For example, our clean room was established during the RAE2008 period with £1m of ERDF funding. Such infrastructure remains in place and the focus during REF2014 has been on the acquisition of and delivery on quality research funds. If measured using the same criteria as RAE2008, our research expenditure for the REF2014 period would have averaged £2 million per annum for the current assessment period, compared with an average of around £1.25 million per year for the period covered by RAE2008.

In terms of income won, **funding secured during the period is in excess of £4.00m**, including £1.19m of FP7 funding, £576,000 of TSB research funding and £1.70m TSB knowledge transfer funding. Major research grants operating during the REF period include four major FP7 grants, IDEAS, SEMANCO, DIGINOVA and InFuLOC (230749). As an indicator of current momentum and future trajectory, the total of **grants within our current portfolio which run beyond the REF period amounts to over £2.50m**: see Table 1.

Table 1: Current funding portfolio with end-dates beyond REF period.

Project	Funding Source	Dates	Teesside Funding
Datum360	TSB KTP	10/11-1/14	£132,680
Swarco Ltd	TSB KTP	4/13-1/14	£39,483
DIGINOVA (FP7 GA290559)	FP7	3/12-2/14	£35,000
SEMANCO (FP7 GA287534)	FP7	9/11-8/14	£430,000
Niven Architects	TSB KTP	9/12-9/14	£108,949
Ryder Architecture Ltd	TSB KTP	4/13-4/15	£108,949
Mech-Tool Engineering Ltd	TSB KTP	8/13-8/15	£102,254
IDEAS (FP7 GA600071)	FP7	11/12-10/15	£410,000
PYROCHAR (FP7 GA603394)	FP7	11/13-10/15	£306,487
Colour Urban Design Ltd	TSB KTP	11/13-11/15	£114,846
HiVEM 28239-196187	TSB Technology Inspired Innovation	12/13-11/15	£149,969
Increasing efficiency in fried food production 23279-161174	TSB	5/13-4/16	£353,632
EP/K504609/1	EPSRC iCASE	6/13-12/16	£67,443
Development of WLC BIM (NPRP Grant 604-2-253)	Qatar Foundation	11/13-11/16	£195,000
One Planet Middlesbrough: Creating Sustainable Communities SRC/2/010440814	Big Lottery Fund via Middlesbrough Environment City	3/13-12/17	£38,120

Other Income: In addition to the secured and committed income referred to above and in REF 4b, significant additional funding arising from interactions with external commercial and governmental bodies has been secured which further underpins the TFI's research interactions with business and supports the applied focus of research activities. We have been highly successful in securing **European Regional Development Funding (£5.5m during the REF period)**. Additionally, the Institute has received over **£1m in government funding to support our Industrial Symbiosis-based industry interactions** and has generated more than **£350,000 in direct consultancy activity** through the University's commercial subsidiary, UTEL.

Infrastructure and Facilities The Technology Futures Institute has a £5m suite of chemical analysis facilities, including: liquid chromatography with ion trap mass spectrometric detection; inductively-coupled plasma mass-spectrometry and atomic absorption spectrometry for elemental

analysis in a range of matrices; x-ray fluorescence and x-ray diffraction; a range of gas chromatography-mass spectrometry and high performance liquid chromatographic capabilities; and thermal analysis.

TFI researchers can access a range of material analytical techniques, including: microscopic infra-red and Raman spectroscopies for micro-scale chemical analysis; XRD and EDAX equipped scanning electron microscopy; physical & chemical surface measurement techniques including surface energy and atomic force microscopy; and specialist facilities such as the Catlab combined Microreactor/integrated Mass Spectrometer for the development/evaluation of catalytic materials.

Our state-of-the-art manufacturing facilities include a micro and nano-manufacturing centre with clean room micro-fabrication and photolithography, wet and dry etching, sputtering, photo electroforming, FIB, micro-milling, micro-injection moulding and laser micro-structuring. 3D printing, anodisation and electroplating, various biomanufacturing facilities, robotic production and assembly, and a specialist system for the production of electrical insulation on wire (at the kilometre scale) and wound components support our research. Alongside these we have a range of mechanical and electrical test facilities up to the kV range, and a range of mechanical testing facilities for static and dynamic loads from the micro scale up to a heavy structural testing laboratory. These activities are supported by a full range of modelling software for design, mechanical and finite element analysis (NX I-DEAS, SolidWorks) and for the analysis of buildings and architecture (REVIT, UcWinRoad, Autodesk, Bently), and a fully equipped general purpose workshop with dedicated technical staff, which is extensively used to support research activities, building lab equipment etc. The University has recently announced a further investment of £10 million in its engineering facilities, which will commence in spring 2014.

e. Collaboration and contribution to the discipline or research base

The TFI is successful in its research strategy to build strategic partnerships and international research activities. TFI members are involved in research collaborations with a wide range of industrial and research institutions from all over the world, in particular within the EU.

Through a special fund set up by the Deputy-Vice Chancellor for Research, TFI is able to invite and fund internationally renowned researchers to work with TFI members on specific research areas. Under this scheme, the **TFI hosted the following visits**: Prof. Renzo Di Felice, Università degli Studi di Genova (Feb 2009); Prof. Shimin Wang, Southeast University, China (Jul 2009); Prof. C. Namasivayam, Bharathiar University, Tamil Nadu, India (Apr-Jul 2010); Dr Takehiko Sasaki, University of Tokyo (May 2010); Dr. H. Moon, Korean Construction Institute (Jun 2010); Dr Julian Proenza, University of the Balearic Islands, Spain (Jun-Jul 2012); Prof Mark Jones, University of Newcastle, Australia (Jul 2012); Prof Xiaoshu Cai, University of Shanghai for Science & Technology (Jul 2012); Jorgen Hvid, Ramboll, Denmark (May 2012); Prof L. Madrazo, School of Architecture La Salle, Universitat Ramon Llull, Barcelona (May 2012 and Sept 2012).

In addition, TFI members are actively involved in visiting international research centres, with **visits frequently funded by international bodies**. These include the Japanese Society for the Promotion of Science, the British Council PMI2, Qatar University, and the Royal Society. The following paragraphs detail collaborations & contributions made to the discipline by TFI members.

Engineering sustainability

Prof. Nashwan Dawood is a **member of the EPSRC peer review panel** and an **expert reviewer** of EU FP7 projects, including 'Research for the Benefit of SMEs.' He has generated around £2m of research income in the REF period. He is **coordinator** of the EU FP7 IDEAS project and **Principal Investigator** three British Council projects with South Korea, Qatar University and Russia, EPSRC iCASE with a major training and multimedia company (DDL) and five KTP projects with Atkins, Ryder Architect, Deepdale Solutions, Niven Architect and Datum360. Prof. Dawood has **extensive international research collaborations** with Osaka and Miyagi Universities funded through the Japanese Society for the Promotion of Science (JSPS), with Qatar University and a host of Qatari Construction companies funded through Qatar University and the British Council, with Gaysang University of South Korea funded by the British Council, with Florida State University funded through a grant from Florida University and with Taiwan National University funded through the Taiwan government. Prof. Dawood was invited to give **keynote presentations** at major international research conferences and meetings (CONVR, CIB W78, QatarBIM, Association of Civil Engineering) held in many countries including Japan, Germany, UK, Taiwan, Qatar, USA and South Korea. Prof. Dawood is a **visiting professor** at a number institutions including: Technion (Israel); Taiwan National University (Taiwan); Osaka and Miyagi Universities (Japan); and Islamic

International University (Malaysia). Prof. Dawood is the **creator of the CONVR (Construction Application of VR) conference series** (www.convr.org), of which thirteen conferences have been held around the world since 2000. He is a major contributor to UK BIM implementation strategies.

Dr. Tracey Crosbie leads work packages in two FP7 projects: SEMANCO and IDEAS and leads the evaluation strategy for a Big Lottery funded project entitled One Planet Middlesbrough. She was an **invited member** of the Technical Programme Committee for the ICT for Sustainable Places conference in Nice in 2013. Dr Crosbie has given **invited presentations at**: the Renaisi/Inbuilt Developing Neighbourhood Approaches to Reducing Carbon Emissions and Tackling Fuel Poverty Workshop, London; an International Meeting of The Austrian Federal Ministry for Transport, Innovation and Technology, Vienna; and the Network for Comfort and Energy Use in Buildings (NCEUB) meeting, University College London. In June 2012 and December 2012 Dr Crosbie was **invited by the Department of Energy and Climate Change** (DECC) to sit on a panel of experts in energy-related behaviours. In 2013 Dr Crosbie was an **external PhD examiner** for the University of Tasmania Australia.

Dr. Mohamad Kassem is a **co-investigator** on a major international project funded by the Qatar Foundation (2013-2016) and is academic supervisor on three **KTP projects**. In 2012 he was an **invited speaker** at the 18th Annual Canadian Construction Forum and is the **coordinator** of the 13th International Conference on Construction Applications of Virtual Reality (CONVR 2013). He was **guest co-editor** of a special issue of the Australasian Journal of Construction Economics and Building conference series.

Manufacturing and Process Engineering

Prof. Simon Hodgson is Professor of Advanced Materials and Dean of the School of Science and Engineering at Teesside University. Over his career he has produced more than 100 publications, generated (as PI) in excess of £1.75 million of research grants and contracts, including EPSRC, DTI, TSB and industrial funding, and coordinated EU research under the Framework Programme. In the REF2014 period he has published two patents forming the basis of a research spin out company (Hot Coatings Ltd – of which he is director), and which has been awarded TSB R&D funding to develop his high temperature insulation technology for commercial application. His ongoing research includes collaborations with Rolls-Royce, Safran (previously Goodrich) and the Universities of Sheffield and Manchester. He is the current PI for Teesside's Workpackage of a TSB Technology Inspired Innovation Project on Advanced Materials (Ref 28239-196187). Externally he is the current president of the Engineering Professors Council, and during this REF period has served as a member of the Expert Evaluator Panels for Framework and Marie Curie programmes, and also reviewed proposals for both the EPSRC and its equivalent in Luxembourg - Fonds National de la Recherche; and has been an invited visitor to Kyoto University in Japan where he presented his research on novel approaches to hybrid materials for extreme environments which underpins his current electrical insulators work.

Prof. Zulfiqur Ali is an **Editorial Advisory Board** member of Micro and Nanosystems from Bentham Science Publishers. He is a **reviewer for the European Commission** (EC) Information and Communications Technologies Priority Area, **EC proposal evaluator** for FP7 and **international panel member** for the Higher Education Academy (HEA) of Ireland for peer review of applications under Phase 2 of their €300 million fifth cycle of the Programme for Research in Third Level Institutions (PRTLI). He has been a **project coordinator** for EU FP6 (Project 34256 and 020316) and FP7 projects (GA230749). Prof. Ali was **International program committee member** and session chair for MEDICON 2013 a conference of the International Federation of Medical and Biological Engineering (IFMBE) with the general theme of 'Research and Development of Technology for Sustainable Healthcare'. He has **active research links** with a number of industrial and academic partners including Oce Technologies in the Netherlands, Fujifilm Diosynth, Johnson Matthey, Parc Cientifique de Barcelona, Fraunhofer Institute, VTT in Finland, Universite Paris Sud and Universite Claude Bernard Lyon, France.

Prof. Maria Olea has **active industrial research collaborations** with IHI in Japan, has served as a **visiting professor** at the University of Tokyo, and has jointly run two British Council funded projects; one with Professor Kazuhiro Mae, Kyoto University and the other with Dr. Penjit Srinophakun, Kasetsart University, Thailand. Professor Olea has been an **external reviewer** for the Innovation and Technology Commission of the Hong Kong Government. She has given **invited seminars** at Thammasat and Kasetsart Universties in Thailand and at the University of Tokyo and Hokkaido University, Japan. She has served as an **external examiner** for research degree exams

at Surrey University and Ghent University, Belgium.

Dr. Yongxin Pang has published 17 journal papers since 2008 and is a peer reviewer for the Journal of Physical Chemistry and Materials Chemistry and Physics. His research on high temperature encapsulation has been sponsored by Rolls Royce at approximately £80k per year since 2009. The outcomes of his research on high temperature insulating materials have led to the incorporation of a spin-out company – Hot Coatings Ltd in 2011.

Analytical Instrumentation, Measurement and Control Engineering

Dr. Meez Islam is a Reader with research interests in the development and engineering of instrumentation for optical spectroscopy. He has been an **expert reviewer for grant applications** for the Netherlands Organisation for Scientific Research. Dr Islam is the **project coordinator** of a forthcoming EU FP7 project, CE-microArray (Grant agreement no. 606618) and has worked closely with Johnson Matthey Catalysts, supported by knowledge transfer funding from ERDF and TSB, and also on collaborative research with Lucite International. His current **research collaborations** include Prof. Gus Hancock and Dr Grant Ritchie at the University of Oxford, Prof. Clemens Kaminski at the University of Cambridge, Prof. Maurice Aalders at the Academic Medical Centre, University of Amsterdam, and the Home Office Centre for Applied Science and Technology. He has been a visiting academic at the Universities of Oxford and Cambridge and has given **invited talks** at the Forensic Society Conference (2012) and the University of Cambridge (2012). Together with Prof Ali he is the co-founder of the start-up company Anasyst and is the co-inventor on two patents (US83225342B2 and ISIS7028).

Dr. Mouloud Denai has served on the **organising committees** of the 8th IFAC Symposium on Biological and Medical Systems, 2012, the 18th IFAC World Congress (IFAC 2011), the International Conference on Automation and Mechatronics (CIAM 2011), and the 6th IEEE International Multi-Conference on Systems, Signals and Devices (SSD 2009). He has delivered an **invited contribution** to *IEEE Transactions on Information Technology in Biomedicine*, Special Issue 'New and Emerging Technologies in Bioinformatics and Bioengineering' and has **active research collaborations** with universities in Taiwan, Algeria and France. In 2010 Dr Denai was awarded the **Medipex Top Prize** in "Software and ICT".

Dr. Tim Thompson is a member of the **Editorial Boards** of the Journal of Forensic Sciences and the Journal of Forensic and Legal Medicine. In 2009 he was the recipient of the Elsevier Top 10 Cited Paper 2006-2008 **Award** for his 2007 paper in Science and Justice. He has delivered **invited contributions** at eight conferences and has given four **invited public lectures** (Durham; UCL; Coimbra, Protugal; and Columbia, USA).

Dr. Michael Short in 2011 **won the James C. Hung award** for best paper at the 16th IEEE International Conference on Emerging Technologies and Factory Automation. He has been a **member of the organising committee** of the IEEE International Conference on Networked Sensing Systems, the IEEE Real-Time Systems Symposium and the IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA) and is a member of the organising committee of the IFAC/IAAA International Conference on Informatics in Control, Automation and Robotics, the UK Embedded Forum/UK Electronics Forum (UKEF), the International Workshop on Real-Time Networks (RTN) and the IEEE International Conference on Emerging Technologies & Factory Automation (ETFA). Dr Short **acted as Chair** at the 2011 International Workshop on Real-Time Networks. Recently Dr Short has **co-organised Special Sessions** at IEEE ETFA 2012 Conference in Poland, at ESREL/PSAM 2012 in Finland and the COMADEM 2011 Conference in Norway.

Dr. Jian Zhang is a **Councillor** of the International Federation of Measurement and Control of Granular Materials, an **Invited Member of the Advisory Board** of Shenyang Science and Technology Association and a Member of the China Multi-Phase Flow Society. He is a Member of the UK's Coal Research Forum and a **contact person for the EU Research Fund for Coal and Steel**. Dr Zhang served as a **Committee Member** for the 8th and 9th International Conference on the Measurement and Control of Granular Materials (ICMGCM) and **Chaired** the plenary session of the 8th ICMGCM and gave an invited keynote speech. In 2011 he delivered an **invited contribution** to Electrostatics (H. Canbolat, ed; InTech). He has **international academic collaborations** with Southeast University, China, University of Newcastle, Australia and Shanghai University for Science and Technology, China, where he was a visiting academic in 2011.