

Elena Gaura

Professor of Pervasive Computing
Coventry University

Personal and career details

Name

Elena Gaura
Nationality: UK
email: e.gaura@coventry.ac.uk

Date of Birth

7th January 1968

Present Post

Associate Dean of Research, Faculty of
Engineering and Computing

Date of Appointment to University

August 1st 2013

Academic Professional Qualifications Degrees etc

Qualification etc (with class)	Awarding Body	Date
PhD	Coventry University, UK	April 2000
BSc in Applied Electronics (First)	Technical University of Cluj Napoca, Romania	July 1991

Career Appointments & Posts (in reverse chronological order)

Appointment / Post	Institution / Employer	Dates
Associate Dean of Research, Faculty of Engineering and Computing	Coventry University, UK	Aug. 2013–
Director of Cogent Computing Applied Research Centre	Coventry University, UK	Jan. 2006–Aug. 2013
Professor of Pervasive Computing	Coventry University, UK	Jan. 2010–
Reader in Pervasive Computing	Coventry University, UK	Jan. 2006–Dec. 2009
Senior Lecturer in Computer Science	Coventry University, UK	June 1999–Dec. 2005
Part-time lecturer and full time Ph.D. student	Coventry University, UK	Jan 1998–June 1999
Researcher	Rutherford Appleton Research Laboratory, Oxford, UK	Aug. 1997–Jan 1998
Research Assistant	Brunel University, UK	April 1996–Aug. 1997
Assistant Professor	Faculty of Electronics, Cluj Napoca, Romania	Sept. 1993–April 1996
Part-time lecturer	Faculty of Electronics, Cluj Napoca, Romania	Sept. 1991–Aug. 1993

Biography

Expertise: Advanced Measurement Systems; Design and Deployment of Real-Life Wireless Sensor Network end-to-end systems; Internet of Things; Intelligent & MEMS Sensors; Sensor Fusion; Data-driven decision making approaches; Distributed energy systems design; Community driven design approaches for socio-technical systems.

Elena received her BSc/MSc in Electrical Engineering in 1989/1991 (Technical University of Cluj Napoca, Romania), and her PhD in Intelligent Sensor Systems in 2000 (Coventry University). She was appointed as inaugural director of the Coventry University's Cogent Computing Applied Research Centre in 2006 (a position she held until her appointment in 2013 as Associate Dean for Research) and was awarded a Professorship in Pervasive Computing in 2009. Over the course of her career, Elena has accrued a sturdy academic reputation in the area of MEMS based smart sensing systems in general and wireless sensor networks (WSNs)/ Internet of Things (IoT) in particular. She is an active disseminator of research to the academic community, industry and wider technology beneficiaries, has over 140 refereed conference publications, 35 peer reviewed journal publications, and is a successful editor of journal special issues and books. She continues to be an active researcher in the areas of Sensing, the Internet of Things, and Distributed Energy Systems.

In her ADR role, she enables, supports and nurtures the continuous development of a sound, rich, faculty-wide research culture—with particular focus on the faculty's 350 early career and postgraduate researchers, as well as those researching in the faculty's international partner institutions. She has set-up structures and processes that promote healthy research growth, root high quality standards in research (from grant proposals writing to output publications), and empower staff to self-assess their work, raise ambition and aspiration as well as benchmark against international peers. Over the past four years, Elena's research and innovation culture development activities and initiatives have also extended to her specialist external research partners, specifically in Indonesia, India, Oman and the Philippines.

She is a keen educator and recently has dedicated considerable effort to researcher skills development activities in the UK, India, Chile, Philippines and Brazil, which were funded through numerous international grants by the British Council and commissioned (within UK) by Innovate UK. In particular, her focus has been the effective translation and embedding of the concepts and standards of rigour, significance and originality into the day to day activities of early career researchers, both at home and abroad. She has worked with the British Council in India, Brazil and the Philippines on the design of various researcher development schemes and has advised the Commission for Higher Education in the Philippines on their postgraduate researcher development strategies.

Elena is engaged with several national and international advisory and grant awarding bodies in the areas of sensing, microsystems, IoT and distributed energy solutions.

She chaired (2007–2013) the UK Wireless Intelligent Sensing Interest Group (WiSIG) within the Electronics, Sensors, Photonics Knowledge Transfer Network and is an expert reviewer and assessor for the European Commission (EC), Leverhulme trust, NERC, Finland Academy of Science and other international funders on Wireless Sensing, the Internet of Things, cloud computing and future manufacturing projects/calls. She is a full member of the UK's Engineering and Physical Sciences Research Council College of Peers (www.epsrc.gov.uk) and serves routinely on the British Council Newton Fund EPSR Panel. She is actively involved with the European Commission and regional government organizations to promote the knowledge transfer from academia to industry and society at large, particularly focusing on the use of sensing technologies for reducing poverty, increasing health, enabling social mobility, and towards the adoption of wireless technologies, Artificial Intelligence and the Internet to tackle global energy challenges.

Elena is an Associate Editor for the IEEE Sensors Journal and a committee member for numerous conferences, including IEEE Sensors and ACM e-Energy. She reviews frequently for a number of

journals, including IOP Measurement Science and Technology, IEEE Trans. on Signal Processing and IEEE Industrial Electronics.

During a research career spanning 25 years, Elena has grown considerable awareness of and insight into a number of engineering disciplines neighbouring the domain of her specialism (sensing). This continues to bring her recognition worldwide as a sound academic, with demonstrated ability to judge the quality of academic work at a variety of levels: from publications in conferences and journals to PhD theses, and research proposals.

A particular strength in Elena's research has been working with application domain specialists, end-users and beneficiaries of IoT systems. She has held and delivered over 30 substantial grants, sponsored by UK's Engineering and Physical Sciences Research Council (EPSRC), the UK Technology Strategy Board (TSB), Royal Society, European Regional Development Fund (ERDF) and EC's FP7 Program, British Council, Singapore- MIT Alliance and benefitted from direct sponsorship from industry (Jaguar Land Rover, Orbit Housing Association, NP Aerospace, Meggitt Ltd, etc). Notably, she received extensive funding from Orbit Housing Association, UK to devise IoT systems that evaluate the environmental and energy performance of buildings, and consumer energy behaviour. Over 200 homes in the UK and 5 impoverished communities worldwide are currently being monitored and are IoT connected through the systems she produced with her team.

Presently her research is with the development of deployable IoT solutions for real-life applications with a focus on: i) robust end-to-end multi-sensor cyber-physical systems design and community focused technologies integration processes, ii) real-time, model-based sensor fusion, information extraction and predictive modelling from wireless sensor networks, iv) integration of decision engines within resource-constrained WSN systems, v) field phenomena event detection and representation using WSNs and vi) long-lived, resource constrained WSNs. She applies and validates most of her innovations in complex socio-technical energy systems, working across the TRL 1-5 band. She brings together multi-disciplinary international teams, across the cyber-physical, energy engineering and social sciences academic and practice domains. Recently she has become active in the Energy arena, through Humanitarian Engineering projects worldwide, designing sensing-based assessment models for energy supply, delivery and usage in off grid settings, towards viable and sustainable end-to-end designs for energy supply systems. She is currently leading 3 international research projects in the IoT/energy arena: EPSRC HELP (EP/P029531/1), DOST-Newton PhD Scholarship (Philippines) (172732595), Institutional Links (Brazil) STAR Energy (261881580). She works with communities in the Amazon, Philippines, Nepal and Rwanda on *energy-for-all* solutions enabled by sensing and the Internet. Elena has graduated 10 PhD students, 8 of which were focused on the wireless sensing domain.

Publications, Outputs and Achievements¹

A list of selected journal and conference publications is given in Appendix A.

Books

E.I. Gaura, L. Girod, J. Brusey, M. Allen and G. Werner Challen (2010) *Wireless Sensor Networks: Deployment and design frameworks*. Springer, edited book, pp. 1–290.

E. Gaura and R.M. Newman (2006) *Smart Sensors and Systems*. Imperial College Press & World Scientific Publishing London, UK, ISBN 1-86094-493-0, pp. 1–539.

Key recent journal papers

Kojo Sarfo Gyamfi, James Brusey, Andrew Hunt, and Elena Gaura. Linear dimensionality reduction for classification via a sequential bayes error minimisation with an application to flow meter diagnostics. *Expert Systems with Applications*, 91(Supplement C):252 – 262, 2018.

R. Morello, S. Mukhopadhyay, E. Gaura, Z. Liu, D. Slomovitz, S. R. Samantaray, and U. Onyewuchi. Guest editorial special issue on smart sensors for smart grids and smart cities. *IEEE Sensors Journal*, 17(23):7594–7595, Dec 2017.

Kojo Sarfo Gyamfi, James Brusey, Andrew Hunt, and Elena Gaura. Linear classifier design under heteroscedasticity in linear discriminant analysis. *Expert Systems with Applications*, 79(Supplement C):44 – 52, 2017.

James Brusey, Diana Hintea, Elena Gaura, and Neil Beloe. Reinforcement learning based thermal comfort control for vehicle cabins. *Mechatronics*, 2017.

Michael Allen, Elena Gaura, Ross Wilkins, James Brusey, Yuepeng Dong, and Andrew J. Whittle. Proof of concept of wireless ters monitoring. *Structural Control and Health Monitoring*, 24(12):e2026–n/a, 2017. e2026 stc.2026.

J. Brusey, J. Kemp, E. Gaura, R. Wilkins, and M. Allen. Energy profiling in practical sensor networks: Identifying hidden consumers. *IEEE Sensors Journal*, 16(15):6072–6080, Aug 2016.

Elena I. Gaura, James Brusey, Michael Allen, Ross Wilkins, Daniel Goldsmith, and Ramona Rednic. Edge mining the internet of things. *Sensors Journal, IEEE*, 13(10):3816–3825, 2013.

Elena Gaura, John Kemp, and James Brusey. Leveraging knowledge from physiological data: On-body heat stress risk prediction with sensor networks. *Biomedical Circuits and Systems, IEEE Transactions on*, 7(6):861–870, December 2013.

Editorial works: Journal Issues editorship

Smart Sensors for Smart Grids and Smart Cities (Journal Special Issue), *IEEE Sensors*, In press, Editors: R. Morello, S. Mukhopadhyay, E. Gaura, Zheng Liu, D. Slomovitz, S. R. Samantaray, U. Onyewuchi.

MEMS & NEMS: Design, Fabrication and Applications - Selected papers of the 14th NSTI Conference (Journal special issue), *Sensors & Transducers Journal*, Vol. 13, pp. 1–158, Dec. 2011, ISSN

¹Please note that throughout this document, external hypertext links are shown as [blue](#) text, while internal links are shown in [red](#). Click on the links to jump to the associated page.

1726-5479.

Principal editor: J. Brusey; co-editors: R. Rednic, E.I. Gaura.

Special feature on Wireless Sensor Networks, Designing for Real-World Deployment and Deployment Experiences (Journal special issue), *Measurement Science and Technology Journal (Institute of Physics)*, Vol. 21, No 12, Dec. 2010, Online: <http://dx.doi.org/10.1088/0957-0233/21/12/120101>.

Principal editor: E.I. Gaura; co-editors: J. Brusey, U. Roedig.

MEMS: From Micro Devices to Wireless Systems (Journal special issue), *Sensor & Transducers Journal*, Vol. 7, pp. 1–225, Oct. 2009, ISSN 1726-5479.

Principal editor: E.I. Gaura; co-editor: J. Brusey.

Microsystems: Technology and Applications (Journal special issue), *Sensor & Transducers Journal*, Vol. 3, pp. 1–106, Dec. 2008, ISSN 1726-5479.

Principal editor: E.I. Gaura; co-editor: J. Brusey.

MEMS and NEMS: Devices and Systems (Journal special issue), *Sensor & Transducers Journal*, pp. 1–136, Oct. 2007, ISSN 1726-5479.

Principal editor: E.I. Gaura; co-editor: J. Brusey.

Key Media articles

1. Property News, “What’s the big idea? The real issues behind energy use and efficiency”
<http://www.propnews.co.uk/issues/2012/06/articles/22/what-s-the-big-idea-the-real-issues-behind-energy-use/>
2. Housing Excellence, 14th September 2011, “Sensing the way forward for greener homes”
<http://www.housingexcellence.co.uk/features/sensing-way-forward-greener-homes>
3. Guardian Professional, 18th May 2011, “Could sensor technology save money on retrofitting? Coventry University is analysing how tenants can use heating systems in a way that doesn’t damage building fabric”
<http://www.guardian.co.uk/housing-network/2011/may/18/sensor-technology-money-retrofitting>

A historical listing of media articles is given in Appendix B.

Research projects / grants / sponsored consultancy

- Currently PI on 3 “energy and IoT” related funded projects: EPSRC HELP (EP/P029531/1): DOST-Newton PhD Scholarship - Philippines (British Council, 172732595), Institutional Links - Brazil STAR Energy (British Council, 261881580).
- External Grants Awarded over last 10 years: Approximately **£9.1mil in substantial grants**, from UK’s Engineering and Physical Sciences Research Council (EPSRC), the UK Technology Strategy Board (TSB) and Innovate UK, Royal Society, European Regional Development Fund (ERDF) and EC’s FP7 Program, British Council, Singapore-MIT Alliance and direct sponsorship from industry (Jaguar Land Rover, Orbit Housing Association, NP Aerospace, Meggitt Ltd, etc). (*Listing of grants received with dates and sponsors details in Appendix C.*)

- Total group income to Coventry University of approximately **£3.9mil** in 5 key application areas, over the past 10 years: Humanitarian Energy, Health and Human Operators Safety, Automotive & Aerospace, the Built Environment, and the Ageing Society
- Live projects portfolio value as of January 2018: **£1.5 mil**
- External Medium and Large Grant Awards (over £150,000 to CU): 8 with a value to CU of over £2.6 mil
- Small external grants and internal, institutional strategic funding awards: £608,000 over the past 10 years;
- PI on British Council-Newton Bhabha Fund—PDE Framework Grant—Women in Science—Science Administration and Management.
- IoT projects recently delivered as PI: STARGATE (Funder: EC FP7 with Rolls Royce), OWLS (Funder: TSB and EPSRC, with Encraft Ltd), RESTRUCTURE (Funder: Singapore-MIT Alliance); Institutional Links Grant (Philippines): PULP-SEED (British Council, 172732595), Researcher Links grant (Brazil): ComSe (British Council, 204379812).
- Held 3 EPSRC DTA CASE studentships between 2006 and 2014.
- Frequently commissioned for consultancy work within the Built Environment Low Carbon arena and as a Scientific Expert for the European Commission.
- Academic Collaborators: Cambridge University; MIT, US; Macquarie University, Australia; Southampton University, UK; IIT Delhi, India; University of Indonesia; Technical University of Cluj Napoca, Romania, University of San Carlos, Philippines, Federal University of Santa Catarina, Brazil, Oxford University, UK, Federal University of Amazonas Manaus, Brazil.

Other Research Quality Indicators

Supervision of research degrees

- PhD completions: 10 (8 in the last 6 years).
- Current PhD supervisions: 7 (table 2)
- PhD theses examined as External for other universities: 18 (UK and worldwide)
- Completed PhD theses in the area of wireless sensing and IoT:
 - Diana Hintea, “Reinforcement Learning-based Thermal Comfort Control for Vehicle Cabins“, examiner: Dr. Martin Jones (JLR) - 2015
 - Ross Wilkins, “Approaches to transmission reduction protocols in low-frequency wireless sensor networks deployed in the field“, examiner: Dr. Ajith Parlikad (Cambridge University) - 2015
 - Olukunle Ojetola, “Detection of Human Falls using Wearable Sensors”, examiners: Dr Daniel Neagu (Bradford University, UK), Professor Sorin Hintea (Cluj Technical University, Romania) - 2014
 - Ramona Rednic, “Posture Classification for Real life, Real time Applications”, examiners: Dr Geoff Merrett (Southampton University, UK), Professor DK Arvind (Edinburgh University, UK)- 2014

- Daniel Goldsmith, “Model-based Transmission Reduction and Virtual Sensing in Wireless Sensor Networks”, examiners: Dr Kirk Martinez (Southampton University, UK) and Dr Ian Wassell (Cambridge University, UK) - 2014
- John Kemp, “Body Sensor Networks for Health Monitoring: A Safety Critical Mission Application”, examiner: Professor Kevin Warwick (Reading University, UK) - 2011
- Michael Allen, “Acoustic Localisation for Real-Life Applications of Wireless Sensor Networks”, examiner: Professor Neil White (Southampton University, UK) - 2011

Student name	Role and contribution	Expected completion date
I Putu Edy Suardiyana Putra	Supervisor; Scientific input	March 2018
Alexandra Petre, PhD	Supervisor; supervisory experience	Sept. 2018
Apostolos Kordatos	Supervisor; supervisory experience	Sept. 2018
Gene Fe Palencia,	DoS; Scientific lead	Jan. 2019
Ross Drury	Supervisor; Scientific input	Jan. 2019
Kojo Gyamfi	Supervisor; Scientific input	submitted Jan 2018
Gaobo Chen,	Supervisor; Scientific input	Jan. 2019

Grant Reviewer Activities

UK

- Member of **EPSRC College of Peers** (2003-2012 and 2017 onwards)
- NERC and Leverhulme Trust, Nuffield Foundation, Royal Academy of Engineering and Royal Society - regular grant reviewer
- **British Council** Grant Awarding Panel member - Engineering and Physical Sciences - Newton Fund

Europe

- EC FP6, FP7, H2020 regular reviewer and expert in the areas of Embedded Systems, Future Networks, Factory of the Future, HPC and Internet of Things (30 contracts since 2005)
- Academy of Finland; The Portuguese Fundação para a Ciência e a Tecnologia, I. P. (FCT); National Research Council of Romania

World-wide Canadian Science Council; Slovak Research and Development Agency

Honours, Prizes and Distinctions

- Awarded the status and title of Honorary and Adjunct Professor with Macquarie University, Australia, commencing 25th of March 2013.
- Awarded “Most Innovative Consultant” at the Housing Innovation Awards 2013 – 13th Feb 2013.
- Member of EPSRC College of Peers 2003-2012 and 2017-onwards

- Chair of the Steering Committee - Wireless Sensor Interest Group (WiSIG), Sensors KTN, DTI Advisory Group (2007–2013)
- Member of DTI Micro and Nanotechnology Experts Panel: Road-mapping for UK (DTI – 2005)
- Member of Nanotechnology Experts Panel, National Strategy Meeting (IMechE – 2004)

Programs Committee Membership and Journal Editorship

- Associate Editor for IEEE Sensors (2012 onwards), Sensors and Transducers Journal, International Journal on Smart Sensing and Intelligent Systems (S2IS)
- Reviewer for 12 journals, with highlights such as: IOP MST, IEEE Sensors, IEEE Trans. Industrial Electronics, IEEE Trans. Signal processing, Sensor and Actuators journal, Mechatronics journal, IEEE Trans. Control Systems Technology, Automation in Construction
- Program committee membership at a dozen conferences, rolling year on year, including: ACM e-Energy, Real WSN, IEEE Sensors, IEEE GLOBECOM, SIGDOC, IEEE EMBS, SENSOR-COM (Applications Chair), IEEE International Conference on Tools with Artificial Intelligence (ICTAI), IEEE International Conference on Wireless for Space and Extreme Environments.

Chair and Organizer: Academic and industrial events

- Organizer of over 20 sensing and wireless sensing events for academia, industry or both;
- Chair or Technical-chair for 21 events world wide;

Listing of events organized and chaired in Appendix D.

Keynotes, invited talks, tutorials and workshops²

- Delivered over a dozen keynote talks at conferences worldwide, including a number of IEEE conferences;
- Designed and delivered over a dozen tutorials and two dozen invited talks at academic and industrial events;

Listing of Keynotes, invited talks, tutorials and workshops in Appendix E.

²All activities have been fully or partially sponsored by the events organizers or through external sources (Royal Society and Royal Academy of Engineering).

Appendix A: Outputs and achievements

Google Scholar profile: <https://scholar.google.co.uk/citations?user=NILVLIAAAAAAJ&hl=en>

Research Monograph

Gaura, E. Newman, R.M. (2006) *Smart Sensors and Systems*. Imperial College Press & World Scientific Publishing London, UK, ISBN 1-86094-493-0 pp. 1–539

Selected journal papers and book chapters (2012-2017)

Kojo Sarfo Gyamfi, James Brusey, Andrew Hunt, and Elena Gaura. Linear dimensionality reduction for classification via a sequential bayes error minimisation with an application to flow meter diagnostics. *Expert Systems with Applications*, 91(Supplement C):252 – 262, 2018.

R. Morello, S. Mukhopadhyay, E. Gaura, Z. Liu, D. Slomovitz, S. R. Samantaray, and U. Onyewuchi. Guest editorial special issue on smart sensors for smart grids and smart cities. *IEEE Sensors Journal*, 17(23):7594–7595, Dec 2017.

Kojo Sarfo Gyamfi, James Brusey, Andrew Hunt, and Elena Gaura”. Linear classifier design under heteroscedasticity in linear discriminant analysis”. *Expert Systems with Applications*, 79:44 – 52, 2017.

James Brusey, Diana Hintea, Elena Gaura, and Neil Beloe. Reinforcement learning based thermal comfort control for vehicle cabins. *Mechatronics*, 2017.

Michael Allen, Elena Gaura, Ross Wilkins, James Brusey, Yuepeng Dong, and Andrew J. Whittle. Proof of concept of wireless TERS monitoring. *Structural Control and Health Monitoring*, 24(12):e2026–n/a, 2017. e2026 stc.2026.

Chunyang Lei, Hongxia Bie, Gengfa Fang, Elena Gaura, James Brusey, Xuekun Zhang, and Eryk Dutkiewicz. A low collision and high throughput data collection mechanism for large-scale super dense wireless sensor networks. *Sensors*, 16(7):1108, 2016.

Elena Gaura, Michael Allen, Ross Wilkins, and Andrew J. Whittle. Temporary earth restraining structure (singapore). In *Wireless Sensor Networks for Civil Infrastructure Monitoring*, pages 153–160. ICE Publishing, 2016.

James Brusey, John Kemp, Elena Gaura, Ross Wilkins, and Michael Allen. Energy profiling in practical sensor networks: Identifying hidden consumers. *IEEE Sensors Journal*, 16(15):6072–6080, Aug 2016.

David James McCorrie, Elena Gaura, Keith Burnham, Nigel Poole, and Roger Hazelden. Wireless sensor and mobile ad-hoc networks: Vehicular and space applications. chapter Predictive Data Reduction in WSN using Selective Filtering, pages 129–148. Springer-Verlag New York, 2015. ISBN: 978-1-4939-2467-7.

Elena I. Gaura, James Brusey, Michael Allen, Ross Wilkins, Daniel Goldsmith, and Ramona Rednic. Edge mining the internet of things. *Sensors Journal, IEEE*, 13(10):3816–3825, 2013.

Elena Gaura, John Kemp, and James Brusey. Leveraging knowledge from physiological data: On-body heat stress risk prediction with sensor networks. *Biomedical Circuits and Systems, IEEE Transactions on*, 7(6):861–870, December 2013.

Elena Gaura, James Brusey, and Tessa Daniel. Distributed information extraction from large-scale wsns: Approaches and open research issues. In *Modern Sensors, Transducers and Sensor Networks*, pages 261–334. IFSA, July 2012.

Selected conference papers (2012-2017)

Kojo Sarfo Gyamfi, James Brusey, and Andrew Hunt”. K-means clustering using tabu search with quantized means. In *WCECS 2016 - World Congress on Engineering and Computer Science 2016*, volume 2225, pages 426–432. Newswood Limited, 2016.

Ross Wilkins, Elena Gaura, Michael Allen, John Kemp, James Brusey, and Andrew J. Whittle. Re-structure: A wireless sensor network for monitoring temporary earth retaining systems. In *Proceedings of the 6th ACM Workshop on Real World Wireless Sensor Networks*. ACM, November 2015.

I Putu Edy Suardiyana Putra, James Brusey, and Elena Gaura. A cascade-classifier approach for fall detection. In *Submitted to 5th EAI International Conference on Wireless Mobile Communication and Healthcare - "Transforming healthcare through innovations in mobile and wireless technologies" (Mobihealth 2015)*, November 2015.

Olukunle Ojetola, Elena Gaura, and James Brusey. Data set for fall events and daily activities from inertial sensors. In *Proceedings of the 6th ACM Multimedia Systems Conference (MMSys '15)*, pages 243–248, Portland, Oregon, March 2015. ISBN: 978-1-4503-3351-1.

John Kemp, Elena Gaura, Michael Allen, and James Brusey. Optimising low power dual prediction systems. In *Proceedings of the 6th ACM Workshop on Real World Wireless Sensor Networks*, pages 7–10. ACM, November 2015.

Diana Hintea, James Brusey, and Elena Gaura. A study on several machine-learning methods for estimating cabin occupant equivalent temperature. In *Proceedings of the 12th International Conference on Informatics in Control (ICINCO 2015)*, Colmar, Alsace, France, 21–23 July 2015.

John Halloran, Setiadi Yazid, Dan Goldsmith, Ross Wilkins, and Elena Gaura. Cool to warm up? understanding student energy behaviour in indonesian university buildings. In *Proceedings of 2015 TAU Conference "Mitigating and Adapting Built Environments for Climate Change in the Tropics"*, pages 83–95, Jakarta, Indonesia, 30–31 March 2015.

Ross Wilkins, James Brusey, Elena Gaura, Mike Allen, and John Kemp. Edge mining for energy efficient iot. In *Proceedings of Workshop on Internet of Things - a Deeper Dive 2014*, Brussels, Belgium, 16 December 2014.

Ramona Rednic, John Kemp, Elena Gaura, and James Brusey. Fielded autonomous posture classification systems: Design and realistic evaluation. In *Proceedings of the 14th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD 2013)*, pages 629–634, Honolulu Hawaii, U.S.A., 1–3 July 2013.

John Kemp, Elena Gaura, Ramona Rednic, and James Brusey. Long-term behavioural change detection through pervasive sensing. In *Proceedings of the 14th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD 2013)*, pages 635–640, Honolulu Hawaii, U.S.A., 1–3 July 2013.

Ramona Rednic, Elena Gaura, James Brusey, and John Kemp. Wearable posture recognition systems: factors affecting performance. In *Proc. IEEE-EMBS Intl. Conf. Biomedical and Health Informatics (BHI 2012)*, pages 200–203, Shenzhen, China, January 2012.

John Kemp, Elena Gaura, and James Brusey. Predicting uncompensable heat stress with embedded, wearable sensors. In *Proc. IEEE-EMBS Intl. Conf. Biomedical and Health Informatics (BHI 2012)*, pages 475–478, Shenzhen, China, January 2012.

John Halloran, Elena Gaura, James Brusey, John Barnham, Ramona Rednic, John Kemp, and Ross Wilkins. Cogent-Orbit POE: an integrated, longitudinal occupant empowerment package. In *BEhave Book of Abstracts*, page n/a, 20–21 Sept. 2012.

Elena Gaura, John Halloran, James Brusey, Ross Wilkins, and Ramona Rednic. Sustainable future? building and life-style assessment. In *Proceedings of the International Conference on Advanced Computer Science and Information Systems (ICACISIS 2012)*, pages 1–7, Jakarta, Indonesia, 1–2 Dec. 2012.

Ramona Rednic, John Kemp, Elena Gaura, and James Brusey. Networked body sensing: Enabling real-time decisions in health and defence applications. In *Proc. Annual Intl. Conf. Advance Computer Science and Information Systems 2011 (ICACISIS 2011)*, pages 17–24, Jakarta, Indonesia, December 2011.

Olukunle Ojetola, Elena Gaura, and James Brusey. Fall detection with wearable sensors—SAFE (smart fall detection). In *Proc. 7th Intl. Conf. Intelligent Environments*, pages 318–321, Nottingham, UK, July 2011. IEEE Press.

Elena Gaura, James Brusey, Ross Wilkins, and John Barnham. Inferring knowledge from building monitoring systems: The case for wireless sensing in residential buildings. In *Proc. Conf. Clean Technology*, pages 353–358. NSTI, June 2011. Online: <http://www.ct-si.org/publications/proceedings/procs/Cleantech2011/8/1124>.

Elena Gaura, James Brusey, and Ross Wilkins. Wireless sensing for the built environment: Enabling innovation towards greener, healthier homes. In *Proc. Conf. Clean Technology*, pages 367–372. NSTI, June 2011. Online: <http://www.ct-si.org/publications/proceedings/procs/Cleantech2011/8/1122>.

Elena Gaura, James Brusey, and Ross Wilkins. Bare necessities—knowledge-driven WSN design. In *Proc. 10th IEEE Sensors Conf.*, pages 66–70. IEEE Press, October 2011.

James Brusey, Elena Gaura, and Roger Hazelden. WSN deployments: Designing with patterns. In *Proc. 10th IEEE Sensors Conf.*, pages 71–76. IEEE Press, October 2011.

Appendix B: Media articles listing

1. Innovate Issue 19, Winter 2017, “Bringing off-grid power to the Brazilian Amazon”
<http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate Issue 19 final.pdf>
2. Innovate Issue 13, Spring 2013, “Sitting on a bright idea”
<http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate Issue 13 final.pdf>
3. The Guardian, 4th Jan 2013, “Sustainable housing movement held back by lack of tenant data”
<http://www.guardian.co.uk/housing-network/2013/jan/04/sustainable-housing-tenant-data>

4. Innovate Issue 12, Winter 2012, “Sustainability on a world stage”
<http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate Issue 12.pdf>
5. Housing Associations Building Magazine (HABM), July-August 2012, “Home studying”
6. Innovate Issue 11, Spring 2012, “In the driving seat for comfort”
http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate_Issue11.pdf
7. Local Authority Building and Maintenance magazine, Feb 2012 issue, pp 28-29, “Human Behaviour”
8. Innovate Issue 10, Winter 2011/2012, “Older people taking the lead on technology”
http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate_Issue10.pdf
9. Property News, “What’s the big idea? The real issues behind energy use and efficiency”
<http://www.propnews.co.uk/issues/2012/06/articles/22/what-s-the-big-idea-the-real-issues-behind-energy-use/>
10. Housing Excellence, 14th September 2011, “Sensing the way forward for greener homes”
<http://www.housingexcellence.co.uk/features/sensing-way-forward-greener-homes>
11. Home Heating Guide, 23rd May 2011, “Coventry University Develops Smart Sensor Technology”
<http://www.homeheatingguide.co.uk/blog/coventry-university-develops-smart-sensor-technology.html>
12. Guardian Professional, 18th May 2011, “Could sensor technology save money on retrofitting? Coventry University is analysing how tenants can use heating systems in a way that doesn’t damage building fabric”
<http://www.guardian.co.uk/housing-network/2011/may/18/sensor-technology-money-retrofitting>
13. Inside Housing, 8 November 2011, “Best behaviour - Increasing energy efficiency isn’t just about fitting the latest technology”
<http://www.insidehousing.co.uk/eco/best-behaviour/6518878.article>
14. Innovate Issue 8, Autumn 2010, “Sensing Housing”
http://www.coventry.ac.uk/Documents/Research Documents/Innovate magazine/Innovate_Issue8.pdf

Appendix C: Grants awarded

Funding Body	Subject Area	Date	Amount
EPSRC GCRF HELP - Humanitarian Energy for Displaced Populations in Refugee Camp and Informal Settlements (EP/P029531/1)	Humanitarian Energy, IoT, Distributed Energy Systems	September 2017–August 2020	Total Value: £1,114,390; To CU:£1,100,000
British Council Institutional Links (Brazil) STAR Energy (261881580)	Internet of Things, microgrids, energy, poverty	March 2017–March 2019	Total Value: £60,000; To CU: £50,000
Commission on Higher Education in partnership with the British Council - JOINT DEVELOPMENT OF NICHE PROGRAMS THROUGH PHILIPPINE-UK LINKAGES	Developing the Dual Degree Doctoral Program in Engineering CU/USC	January 2017–January 2019	Total Value: £38,675
British Council - PDE Framework: Chile (2016_NF_PDE_Chile_1; 01/03/16-31/07/16) and India (01/02/17-01/04/19)	Researcher Development Interventions: Communications, Writing, Science Administration; Science Management	May 2016–December 2019	Total value £209,023; To CU:£209,023
British Council DOST-Newton PhD Scholarship (Philippines) (172732595)	Internet of Things, microgrids, energy, poverty	January 2016–January 2019	Total Value: £91,757; To CU: £47,667
British Council Newton Fund: Institutional Links Grant (Philippines): PULP-SEED (172732595)	Internet of Things, energy, poverty	April 2015–April 2017	Total Value: £150,895; To CU: £103,352

Funding Body	Subject Area	Date	Amount
EPSRC & Innovate UK: Scaling up Retrofit of our Nation's Home Programme (Off-site Wrap-around Large-Scale Retrofit -OWLS)	Wireless Sensing, Electronics	September 2013–March 2016	Total Value: £667,219; To CU: £75,358 (from F)
EU FP7: STARGATE	Wireless Sensing, Electronics	Nov 2012–March 2016	Total Value: £5,000,000; To CU: £320,000
Jaguar Land Rover: STRIVE 2	Wireless Sensing, Electronics, Comfort	Nov 2014–Sep 2015	Total Value: £194,435
Singapore- MIT Alliance for Research and Technology (SMART) - Center for Environmental Sensing and Modeling (RESTRUCTURE)	Wireless Sensing, Electronics, IoT	Jan 2014–July 2015	Total Value: £242,000; To CU: £242,000
Orbit Heart of England Housing Association- various grants on Buildings Instrumentation concepts, implementation and deployment, Passiv House complex evaluation, Retrofit/AirSource complex evaluation	Wireless Sensing, Electronics, Energy, Buildings, IoT	Jan 2009–April 2015	Total Value: £420,000; To CU: £420,000
British Council Researcher Links grant (Brazil): ComSe (204379812)	Internet of Things, microgrids, social scientists	December 2015–March 2015	Total Value: £52,200; To CU: £21,5000
TSB PLACES - Low weight seating design for premium vehicles	Wireless Sensing, Physiological Measurement	Oct 2012–Nov 2014	Total Value: £70,793; To CU: £70,793

Funding Body	Subject Area	Date	Amount
Gumpp Maier: GmbH Refurbishments monitoring	Wireless Sensing, Electronics, Energy, Buildings, IoT	Aug 2013–Sep 2014	Total Value: £35,000
Salford Uni / DECC: Passive house comfort monitoring	Wireless Sensing, Electronics, Energy, Buildings, IoT	Aug 2013–Aug 2014	Total Value: £51,000
Jaguar Land Rover: STRIVE: Machine learning for thermal comfort	Wireless Sensing, Electronics, Car cabin comfort	Sep 2013–Mar 2014	Total Value: £71,248
TSB KTP: Low carbon buildings evaluation tools - energy and environment	Wireless Sensing, Energy, Buildings, IoT	Oct 2010–Oct 2013	Total value: £150,450; To CU: £150,450
EPSRC IeMRC CASE grant, with Orbit Heart of England Housing Association	Wireless Sensing, Electronics	Sept. 2009–April 2013	Total Value: £64,294; To CU: £64,294
Jaguar Land RoverL Thermal comfort oriented ATC	Wireless Sensing, Electronics,, Car cabin comfort	Nov 2011–Apr 2012	Total Value: £126,000
EPSRC- IPM KTN + TRW Conekt, Vibro Meter (CASE)	Wireless Sensing, Electronics	Sept 2008–April 2012	Total Value: £64,000; To CU: £64,000
Advantage West Midlands (AWM): Low Carbon Vehicle Technology Project.	Wireless Sensing, Electronics, Car cabin comfort	Dec 2009–Dec 2011	Total Value: £80,000

Funding Body	Subject Area	Date	Amount
HEFCE Economic Challenge Innovation Fund (ECIF) Training and consultation to niche automotive manufacturing industry in the area of wireless sensor networks.	Wireless Sensing, Electronics	May 2009–Sep 2010	Total Value: £80,000
NP Aerospace Further development of body sensor network for Explosive Ordnance Disposal suit monitoring and control	Wireless Sensing, Electronics	Oct 2009–Dec 2009	Total Value: £3,000
EPSRC- IeMRC CASE grant, with NP Aerospace, Coventry	Wireless Sensing, Electronics	Oct. 2006–Sept. 2009	Total Value: £49,125; To CU: £49,125
Coventry University Instrumenting the New Engineering Building	Wireless Sensing, Electronics	Jan 2009–Aug 2009	Total Value: £77,000
Institutional Grants and Strategic investment funding in my research			
Coventry University- Strategic Funding competition for establishment of ARCs	Pervasive Computing	Jan. 2006-Jan. 2010	£525,000
Nuffield Foundation, Summer Internships scheme	Pervasive Computing	June-Aug 2005, June-Aug 2006	£2,650

Funding Body	Subject Area	Date	Amount
Coventry University -PhD studentship- project sponsorship	Pervasive Computing	Oct. 2005- Sept. 2008	£50,000
Microsoft Inspire Program & East London Univ. South Africa- Research Expertise sharing	Pervasive Computing	24-29 April 2006	£3,000
National Physics Laboratory, UK -Training course/consultancy	Pervasive Computing	17-24 March 2006	£2,900
Coventry University, Student recruitment grant	Pervasive Computing	Jan. 2005-July 2005	£10,500
HEFCE, PhD Bursaries Scheme	Intelligent Systems	2002, 2003, 2004, 2006	Total Value: £25,000; To CU: £25,000
Coventry University, Small grant scheme	Pervasive Computing	April 2004-April 2005	£3,000
NSTI, Research sponsorship	Intelligent Systems, Pervasive Computing	2003, 2004, 2005, 2006	£2,500
Roy.Ac. of Eng., International travel grants	Intelligent Systems, Pervasive Computing	Various short term	£4,000
Roy.Soc., International travel grants	Intelligent Systems, Pervasive Computing	1999-2007	£2,170
EU, Individual Tempus Grant	Artificial Intelligence	January-April 1996	£3,000

Funding Body	Subject Area	Date	Amount
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Appendix D: Academic and industrial Events: Chair and Organizer

Role	Conference	Date
International advisory board member	International conference on social science and engineering technology (ICSSET)	May 2016, Indonesia
Organizer and Technical co-chair	RealWSN workshop in conjunction with ACM Sensys 2015	Nov 2015, Seoul
Organizer and Chair	Summer school, University of San Carlos, Cebu, Philippines - SenseDev	April 2015
Programme co-chair	PerCom 2016, IEEE Workshop on Managing Ubiquitous Communications and Services (MUCS), http://www.percom.org/	March 2016, Sydney
Chair – Applications Strand	SENSORCOM 2011 & 2012	2011, 2012
Organizer and chair	Special sessions x2 – IEEE Sensors 2011, Limerick, IR	30th Oct. 2011
Organizer and chair	Cool Ideas for a Hot Topic, Coventry, UK	4th Oct. 2011
Organizer and chair	Symposia - MEMS & NEMS Fabrication, Devices & Applications (within Nanotech and CleanTech 2011, Boston, USA) Symposia: Sensors and Systems, MEMS and NEMS: Devices and Applications and MEMS Fabrication: Design, Manufacture and Instrumentation	13–16 June 2011
Organizer and chair	“EPS KTN - Wireless Sensing for Smart Buildings TechnoCentre, Coventry University”	10 Feb. 2011

Role	Conference	Date
Chair and Conference track Organizer	“Electronics and Microsystems Suite, NanoTechnology International Conference and Trade Show – 2011, Boston, USA”	2011
Organizer	3rd Wireless Sensor Networks Showcase	27th Sept. 2010
Chair and Conference track Organizer	Electronics and Microsystems Suite, NanoTechnology International Conference and Trade Show – 2010, Santa Clara, USA Symposia: Sensors and Systems, MEMS and NEMS: Devices and Applications and MEMS Fabrication: Design, Manufacture and Instrumentation	June 2010
Chair and Organizer	8th Meeting of the Wireless Sensing Interest Group (WiSIG)	10th Sept. 2009
Co-chair and Organizer	2nd Wireless Sensor Networks Showcase	2nd July. 2009
Chair and Conference track Organizer	Electronics and Microsystems Suite, NanoTechnology International Conference and Trade Show – 2009, Houston, USA Symposia: Sensors and Systems, MEMS and NEMS: Devices and Applications and MEMS Fabrication: Design, Manufacture and Instrumentation	May 2009
Co-chair and Organizer	1st Wireless Sensor Networks National Showcase	1st July 2008
Conference track Organizer and Chair	Electronics and Microsystems Suite, NanoTechnology International Conference and Trade Show – 2008, Boston, USA	June 2008
Conference co-chair	World Congress on Engineering 2007 (International Association of Engineers), International Conference on Wireless Networks	July 2007

Role	Conference	Date
Conference track Organizer and Chair	Electronics and Microsystems Suite, NanoTechnology International Conference and Trade Show – 2007, Santa Clara, USA	May 2007
Symposia Organizer and Chair	NanoTechnology International Conference and Trade Show – 2007, Santa Clara, USA MEMS & NEMS Symposium; Sensors & Systems Symposium; MSM - Modeling Microsystems Symposium; Sensors and Systems Symposium	May 2007
Organizing Chair	Modelling and Simulation of Microsystems Symposium MEMS and NEMS Symposium NanoTechnology International Conference and Trade Show – 2006, Boston, USA	May 2006
Organizing Chair	The 23 rd ACM International Conference on Design of Communication: Documenting & Designing for Pervasive Information (SIGDOC 2005), Coventry, UK	Sept. 2005
Workshop co-organizer	The 20th ACM SIG International Conference on Object-Oriented Programming, Systems, Languages and Applications OOPSLA 2005, San Diego, USA	Oct. 2005
Symposium Organizer and Chair	Smart Sensors and Systems, NanoTechnology International Conference and Trade Show –2004, 2005, Anaheim, USA	May 2005
Special Session Organizer	Nanotech 2004 (Nanotechnology Conference and Trade Show) – Special Session track – Smart MEMS and Sensor Systems, Boston, USA	March 2004
Conference Track Organizer	MSM 2003 (Modeling and Simulation of Microsystems) –Smart MEMS and Sensor Systems, San Francisco, USA	April 2003

Role	Conference	Date
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Appendix E: Keynotes, invited talks, tutorials and workshops³

Activity	Conference/Event	Date
Workshop—H2020 training day (2)	<i>Full Day</i>	April 2016
Keynote—H2020 Evaluators perspective	Innovate UK H2020 brokerage event	June 2016
Invited talk—PULP-SEED an Institutional Links project	Newton Fund Strategic Network Meeting	March 2016
Invited talk—IoT and Smart Cities	IIT Delhi (Environmental sciences and Civil Eng Departments)	November 2015
Invited talk—Wireless Sensing Futures	IISc Bengaluru	November 2015
Workshop—H2020 training day (1)	<i>Full Day</i>	October 2015
Keynote—Wireless Sensing and the Internet of Things	2015 International Conference on Intelligent and Interactive Computing (IIC 2015)	Malacca, Aug 11-13th 2015
Keynote—Our IoT society - APWiMob 2015	IEEE Asia Pacific Conference on Wireless and Mobile 2015	Banding, Indonesia, 27-29 August 2015
Keynote—From Data to Knowledge: Sensors, Machine Learning and the Internet of Things	BMWA	25th March 2015, London
Keynote—Body Sensors networks: challenges and opportunities	IEEE MedCom 2014	Nov 2014, Delhi, India
Sensing for Safety Tutorial	Asian-Pacific Conference on Communications: “Smart Communications to Enhance the Quality of Life”	29th–31st Aug. 2013

³All activities have been fully or partially sponsored by the events organizers or through external sources (Royal Society and Royal Academy of Engineering).

Activity	Conference/Event	Date
Invited talk: Occupied building - from Data to Information and (maybe) Knowledge	The building performance gap - closing it through better measurement	05th Dec 2012
Invited talk: Occupied buildings - Performance assessment & the raise of sensor technologies: Why? How? and...The benefits?	iNet: Building performance in use - the rise of sensor technologies - This event has already finished	20th Nov 2012
Invited talk: Measurement: Productizing sustainable renovation/retrofit and zero carbon buildingsE	RETROEXPO	1st Nov 2012
Workshop: “Wireless Sensor Networks for a sustainable future”	2011 International Conference on Advanced Computer Science and Information Systems (ICACSIS)	Dec 2011
Keynote: Understanding the World Through Pervasive Sensing	2011 International Conference on Advanced Computer Science and Information Systems (ICACSIS)	Dec. 2011
Invited Talk: Transforming The UK’s ‘Leaky’ Building Stock Via Sensor Technology	The Building Services Event 2011	11th Oct. 2011
Invited talk: “Sensing for Buildings”	Cleantech 2011	13th June 2011
Opening Keynote: “Wireless sensing for an information driven society”	IEEE Information Society	27th June 2011
Tutorial: WSNs – essentials for deployments	IEEE Sensors 2010	1st—5th Nov. 2010
Opening Keynote: “WSNs: The story of a disruptive technology”	IEEE ICITST	8th–11th Nov. 2010
Opening talk “The value of deployment in WSN Research”	2nd Wireless Sensor Networks Showcase	2nd July 2009
Keynote talk “MEMS and Wireless: bringing the power of small to the world”	NanoTechnology International Conference and Trade Show, Houston, USA	5–6 March 2009

Activity	Conference/Event	Date
Keynote talk “Wireless Sensor Networks: Design and deployment of real-life applications”	WSN&CO – Concertation Meeting on Wireless Sensor Networks and Cooperating Objects, Brussels	5–6 March 2009
Invited talk: Wireless Sensor Networks: applications	Center for Computing Technologies (TZI) Universitaet Bremen	Jan. 2009
Invited talk: Wearable systems – challenges	Reading University, School of Systems Engineering, Reading, UK	27 Nov. 2008
Tutorial: Sensing and actuation: end-to-end wireless systems design for mission critical applications	IEEE ISWC 2008 12th International Symposium on Wearable Computers, Pittsburgh, USA	28th Sept–2nd Oct 2008
Tutorial: Emerging Networked Sensing Technologies: Practical designs for real-life applications	IEEE Sensors 2008, Lecce, Italy	25–29 Oct. 2008
Tutorial: Emerging networked sensing and actuation technologies: end-to-end wireless systems design for mission critical applications	IEEE ISIE 2008, Cambridge, UK	30 June–2nd July 2008
Tutorial: Field Sensing and Actuation – enabling new applications	IFAC 2008, Seoul, Korea	5–10 July 2008
Opening talk: Practical achievements in wireless sensing	Wireless Sensor Networks National Showcase, Teddington, UK	1st July 2008
Invited talk: Theory and practice in Wireless Sensor networks – Bridging the Gap	EPSRC Bridging the Gap Workshop, University of Bath	Dec. 2007
Invited talk: Large scale wireless sensor networks – defining architectural requirements for field sensing	Leicester University, Computer Science Seminar Series	Oct. 2007

Activity	Conference/Event	Date
Keynote: From Sensors to large scale systems	World Congress on Engineering 2007 (International Association of Engineers), International Conference on Wireless Networks	July 2007
Panel Member: Wireless and Mesh Networks	Vehicular Technologies Conference – Spring 2007, Dublin, Ireland	April 2007
Invited talk: Cogency concepts for large scale wireless sensor networks	Vehicular Technologies Conference – Spring 2007, Dublin, Ireland	April 2007
Workshop- Living the Dream : Wireless Sensor Networks in Science and Society (Video Presentation)	IEEE ICIA 2006, 2nd International Conference on Information and Automation, Colombo, Sri Lanka	Dec. 2006
Invited talk- WIRELESS SENSOR NETWORKS: REALIZING THE DREAM	Chip on the Mountains, SBMicro Forum, Ouro Preto, Brazil	Aug. 2006
Tutorial- From Sensors to networks	Chip on the Mountains, SBMicro Forum, Ouro Preto, Brazil	Aug. 2006
Invited talk- Field sensing - Realizing the potential of Wireless Sensor Networks	Sensors KTN – ISP Meeting, London	July 2006
Invited talk- Field sensing-the real pay-off for pervasive computing	Pervasive computing- The next wave of IT?, IET, London	May 2006
Tutorial: Smart MEMS and Sensor Systems 1: Practical aspects of wireless sensor network design.	IEEE ICMA 2006, China	June 2006
Tutorial: Smart MEMS and Sensor Systems 2: Cogent sensing and intelligent applications.	IEEE ICMA 2006, China	June 2006
Tutorial: Wireless sensor networks: the dream applications	IEEE Sensors 2005, Irvine, California, USA	Oct. 2005
Invited talk: Engineering Software for Pervasive Computing	Software Engineering Symposium, Bangkok, Thailand	April 2005

Activity	Conference/Event	Date
Invited talk: Engineering Software for Pervasive Applications: implications for Software Engineering education	Software Engineering Symposium, Kuala Lumpur, Malaysia	April 2005
Workshop on Pervasive Computing (organizer and chair)	Software Engineering Symposium, Bangkok, Thailand	April 2005
Tutorial: MEMS enabled Microsystems: from dumb to cogent sensors	The 2004 IEEE International Conference on Intelligent Mechatronics and Automation, Chengdu, China	Aug. 2004
Tutorial: MEMS enabled Microsystems: Cogent sensing and intelligent applications	1st International Conference on Informatics in Control, Automation and Robotics (ICINCO2004), Setubal, Portugal	Aug. 2004