Institution: **University of York**

Unit of Assessment: **13 - Electrical and Electronic Engineering, Metallurgy and Materials**

a. Overview

The Department of Electronics aims to conduct influential research with the highest levels of originality, rigour, and value. We build teams around successful researchers, collaborate with leading groups worldwide, and seek the highest-impact industry partnerships.

Communications & Signal Processing (*Burr, Daffern, de Lamare, **Grace**[1], Howard, Mitchell, Murphy, Zakharov*) Group size (academics, PDRAs and RSs) = 60

Recognised for its work in distributed MIMO systems and physical layer networking, development of high capacity density communications for beyond next generation systems, signal processing algorithms for communications and radar, cognitive radio and networks, the auralisation of acoustic environments, singing analysis and human voice synthesis.

Intelligent Systems (*Halliday, Miller, Smith, Timmis, Trefzer, **Tyrrell**[1]*) Group size = 34

Recognised for its work on evolutionary computation applied to hardware design, artificial immune systems, invention and development of Cartesian Genetic Programming, fault tolerance in electronic and swarm robotic systems*,* use of evolutionary techniques for diagnosis and monitoring of neurological conditions - Parkinson's and Alzheimer's disease.

Physical Layer (*Avrutin, Dawson, El-Gomati, Everard, Hirohata, Johnson, **Marvin**[1], Robinson, Xu*) Group size = 36

Recognised for electron optics research, demonstrating scanning electron microscopy imaging with ultra-low energy*,* spintronics and material growth, applied electromagnetics in Aerospace, the Built Environment and assessment of the interaction of electromagnetic energy with biological systems, molecular-electronic interface, microwave systems.

b. Research strategy

In our RAE2008 submission, a number of strategic goals were identified for the assessment period; we revisit these and outline our achievements with respect to them:

Ensure cohesive, vigorous and productive research groups:

- The group structure has supported an environment where collaboration is the norm. Strategic appointments across all three groups have been made, see Section C.

- All groups undertake bi-annual research away days, to inform research strategy and key funding opportunities, actively engaging in research across departments and universities.

- All groups have continued securing major investment from EPSRC, EU, other overseas agencies and industry. For example, Intelligent Systems has seen funding of an EPSRC Platform Grant - Bio-inspired Adaptive Architectures and Systems (*Tyrrell, Trefzer, Timmis*), EU funded project in the area of evolution of novel computation in materials (*Miller*) and from industry, such as Dstl on chemical agent detection (*Timmis, Tyrrell*); Physical Layer has seen funding from EPSRC for Electromagnetic monitoring of semiconductor aging (*Dawson, Marvin, Robinson*), EU for the HIRF-SE project on computational electromagnetic certification of airframes (*Marvin, Dawson, Robinson*) and industry with Seagate Technology, developing new magnetic recording media with high densities (*Xu, Hirohata*); Communications & Signal Processing has seen funding through EPSRC in areas such as signal processing related to voice for counter terrorism (*Howard*), several EU funded projects in the area of wireless communications (*Burr, Grace)* and the MOD in cognitive communications (*Grace, Burr, Mitchell*), and signal processing areas (*de Lamare, Zakharov*).

Provide realistic monitoring of research quality and effective interventions to improve it:

- Research Group leaders were given a more strategic role required to monitor staff in their

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[1] Group leader in bold

group and report twice yearly to the Chair Departmental Research Committee (DRC) & HoD on research performance. An internal peer review process was introduced for all grant applications, operated by Chair DRC and Departmental Research Support Officer [new post since previous RAE] and involving two or more staff in reviewing applications. We have seen an increase in submission rates and success rates as a consequence.

- We provide annual devolved budgets for groups to help achieve their aims and funding for all academic staff to travel to conferences and other institutions to assist collaborative working (average £90,000 per year to academic and research staff), we support staff on personal development courses and have seen 27 staff take 60 courses in the period.

- We actively encourage staff to pursue external fellowships and awards, see Section C.

Provide an environment for sustained long-term research achievement:

- We organised a series of "sandpit" events. A significant outcome of one event, including the departments of Computer Science and Environment was a 3.5 million funded Euro Marie Curie Integrated Doctoral programme in the area of pollution monitoring in urban areas, with Electronics holding the deputy-directorship (*Timmis*), supporting 12 PhDs.

- The Department provides continued investment and support (e.g. flexible working) to achieve long-term goals of translation of research to commercialisation. This has resulted in four spin-out companies being formed within the period (*Tyrrell, Smith, Murphy, Xu*).

- Research and commercialisation activity are facilitated by staff secondments to overseas institutions (*Hirohata*, *Smith*, *Tyrrell*, *Timmis, Xu*), with the Department providing support in the form of time away from regular duties and travel costs.

- We have encouraged significant activity in interdisciplinary areas collaborating with Computer Science (*Timmis, Tyrrell, Mitchell*), Biology (*Timmis*, *Smith*, *Robinson, Tyrrell*), Physics (*Hirohata*, *El-Gomati*, *Xu*), Chemistry (*Johnson*), Environment (*Timmis*), Psychology (*Halliday*), Medical School (*Halliday, Timmis, Smith*) that has led to papers (e.g. best paper at NESEA2012, *Mitchell and CS*) and successful grant applications (e.g. EP/F060041/1 *Tyrrell,* together with CS and Biology).

Future Strategic Aims and Goals

The Department aims to provide an environment where world-leading research is undertaken across our three research groups. During the next five years we will focus on strengthening all groups, reinforcing the Department's standing and potential. We will develop our growing capability in electronics for healthcare and autonomous systems, areas in which the Department already has a broad base of skills. We will focus on increasing staff through appointments in the areas of healthcare and autonomous systems and postgraduate student numbers, increasing research income, research outputs, further developing the research culture and on ensuring that our research has impact. Achievement will be assisted by:

1) Supporting Staff: We will continue to grow the Department by recruiting staff to complement our existing research strengths. This will include academic, research and support staff necessary to achieve credible large-scale grant applications, for example in autonomous systems. This will be achieved by focused replacement of posts, expansion into identified growth areas and continued managed expansion of our student numbers.

2) Achieve sustainability in research student community: We have seen a steady increase of PhDs, almost 50% since last assessment. We will continue to increase the number of high quality postgraduate research students to attain an average level of three students per full time member of academic staff. To achieve this goal:

- we will fund an increasing number of studentships from internal resources;

- we will become even more pro-active in attracting self-funded overseas research students;

- we will engage, via the Research and Innovation Office (RIO), with industry and seek partnerships in sponsorship to attract additional funding from the private sector building on

- spin-out successes;

- we will exploit opportunities for participating in Research Council Centres for Doctoral Training and build on our success with EU Marie Curie fellowship programme.

3) Increase research income: A sustainable model is continued funding from a wide range of sources, e.g. research councils, EU and industry. Increased income will be achieved through:

- expanding our current industrial-base through the RIO;

- building on our mechanisms for increasing the success rates of submitted proposals;

- submission of large multi-disciplinary proposals an example of recent success in this area is the EPSRC Platform Grant 'Bio-inspired Adaptive Architectures and Systems'.

4) Provide a conducive research culture: By building on, and improving, the research culture, we aim to enhance collaboration across the Department and beyond to stimulate the development of new research ideas and proposals. This will be achieved by:

- Departmental investments in research (e.g. travel and open access publishing) and research support (e.g. administrative and technical);

- maintaining at least two research group away days a year and further developing our successful research seminar series delivered by leading experts in the field;

- providing meetings and feedback sessions in response to calls from research funders.

5) Provide appropriate research facilities: Our goal is to continue to develop outstanding research facilities for our research. Any expansion of facilities, and/or investment in new facilities, will be prioritised, based on our vision developed through the DRC and funded by one-off initiative funds through either Research Councils or the Department/University. We will achieve this by:

- providing a rolling equipment replacement programme (in place) supported through Departmental funds, for the servicing of laboratory instruments as well as the replacement of key pieces of instrumentation in the future;

- where appropriate apply to major equipment initiatives from Research Councils.

6) Ensure impact of our research: We will continue to improve our impact through enhanced industry-based research and working closely with the University's RIO to make the best use of the help and services they offer, to exploit potential impact at an earlier stage. This will be achieved by:

- engaging with the RIO and continuing with the "commercialisation reviews" of all research, which allows for early identification of intellectual property issues, patent application and spin-out possibilities. For example this has resulted in patents related to new FPGA architecture design and healthcare technologies and a number of spin-out companies.

Position with reference to RAE 2008

Our position has progressed broadly in line with our plans in 2008. To remove the need to have a split-site Department, thus allowing better integration of all three research groups, the Department did not move to the Heslington East development in 2009. It is now part of the planned redevelopment of the current Heslington West site. The Department has continued to enhance substantial collaborations with departments on both University sites, including: the new **Robotics Facility** (with Computer Science); **Nanocentre** (with Physics and Chemistry); **York Centre for Complex Systems Analysis** (with Computer Science, Biology, Maths and Environment) these have resulted in many cross-council grant applications.

c. People, including:

We have retained and developed our best researchers and recruited new ones in areas of significant achievement, recently two appointments have been made to complement existing strengths and one replacement post. In Intelligent Systems *Trefzer* (early career researcher - ECR) was appointed on a Research Lectureship scheme allowing focus on research for the first three years of appointment, bringing complementary microelectronics and evolutionary computation

expertise to the group. In Physical Layer *Johnson* brings new expertise in bio-molecular electronics and has founded a wet-lab enabling integration of biological components with silicon technologies. In Communications & Signal Processing, *Daffern* (ECR) was a replacement position in the area of audio signal processing and music.

Staff development and support: The University has taken the decision to use the Concordat as a vehicle for change and enhancement for all researchers including, where appropriate, research students. The Department has continued to work with ECRs in developing their research careers in a number of ways:

- The Department operates a mentoring scheme for newly appointed staff and the University runs a Postgraduate Certificate in Academic Practice (PGCAP) programme for newly appointed lecturers;

- Pump-priming funds have been provided to new lecturers to fund equipment (e.g. *Johnson* to establish wet-lab experimental facilities, *Trefzer* to acquire ASIC testing equipment, *Daffern* to acquire portable voice measurement equipment) and costs of international collaborations;

- The teaching commitment of new lecturers is limited to a maximum of 50% of the norm;

- The Department prioritises research student applications to new lecturers (e.g. in 2013 *Trefzer*, *Daffern* and *Johnson* were each awarded PhD studentships);

We have made the following academic promotions: 2 to Personal Chairs (*Xu, Timmis*), 1 to senior staff grade researcher (*Grace*), 4 to Reader (*Miller, Hirohata, Murphy, de Lamare*) and 2 to Senior Lecturer (*Halliday, Mitchell*) within the period, and for research staff we promoted 3 research associates to research fellows (Grade 6 to 7).

The DRC has overall responsibility for research planning ensuring that the necessary support with polices and infrastructure is in place to perform and deliver planned research. The DRC provides coordination for reviewing grant applications prior to submission by two senior members of the Department, at least one from another research group. The DRC coordinates the reviewing of PI responses to funding panels and prioritisation of pump-priming activities.

All academics are given an annual research support budget to cover, e.g. conference participation, equipment purchase which can be topped up through a bounty reward scheme which allows academic to claim for submission of journal papers and grants (£250/journal or grant). Our aim is that every member of academic staff will be eligible for a sabbatical every six years. The sabbatical system is overseen by the DRC and recommendations are made to the HoD on the basis of quality, plans, strategic fit and potential for long term returns. An expectation is that academics visit an institution and/or establish collaborations away from York for some of their sabbatical period.

Research fellowships: From open competition: Royal Academy of Engineering Professorship (*Everard*) in collaboration with BAE Systems; Royal Academy of Engineering Entrepreneurship Fellowship (*Smith*) for his work on commercialisation of medical diagnostic systems; Royal Society-Wolfson Research Merit Award (*Timmis*) for his work on self-healing swarm robotic systems; Royal Society Industry Fellowship (*Hirohata*) with Hitachi.

Visiting academics: We have encouraged an active program of visiting scholars and have received 60 visiting academics in the period, for longer than one week allowing the visitors to deliver research seminars and master classes increasing researches awareness of broader research issues and achievements and submission of international grants. We have appointed a number of Visiting Professors for a period of 5 years: Professor *Martin Haardt* - June 2012 bringing expertise in signal processing and wireless communications; Professor *Alan Winfield* - June 2011 who brings expertise in swarm robotics; Professor *Honggang Zhang* - July 2010 bringing expertise in Cognitive Communications; Professor *Gusz Eiben* – June 2013 who brings expertise in Evolutionary Computing; Professor *Rong Zhang* - Feb, 2012 Distinguished Visiting Fellowship Award from The Royal Academy of Engineering, brings expertise in semiconductor devices.

Equality and diversity: The Department of Electronics has been working with the Athena SWAN agenda since 2008, through its Athena SWAN working group, and achieved the Bronze award in April 2012. A female support officer is also on hand to offer female students support and advice where needed. We ensure that family friendly policies and flexible working arrangements are

highlighted on job adverts, and that all interview panels include a female member of staff. Female academic staff numbers have historically been very low, with only 1 female member of academic staff in 2008, but recent appointments have seen this number increased to 3 full-time and 2 part-time female academic and teaching staff. We expect this to increase over time. We have now formed an equality and diversity committee to work towards a Silver Award within the next 3 years.

(ii) Research students

All studentships are advertised and there is a rigorous selection process involving a recruitment panel. During the assessment period funding for PhDs has been received from Research Councils (e.g. EPSRC, AHRC, STFC), industry (e.g. Dstl, NCR, BAE Systems, BT), the European Commission and overseas Government scholarship (e.g. Thailand, Malaysia, China, India, Iraq, Turkey, Nigeria and Saudi Arabia). We have actively participated in the EPSRC White Rose DTC on Tissue Engineering Regenerative Medicine, EU Marie Curie fellowship programme and the Wellcome Trust program on combating infectious diseases.

To ensure quality PhD **supervision and support** all new staff receive training in student supervision through courses and the PGCAP programme, with over 45 courses being attended by staff during the period. Departmental practice is to meet students at least once a week to ensure effective monitoring of progress and provide suitable guidance. Additional informal support is provided through the research group structure (e.g. suitable mixing of PhD students and PDRAs in offices/labs to allow informal interactions) and the Graduate School that promotes cross-group interactions. All PhD students within the Department have a Thesis Advisory Panel (TAP) consisting of two or more academic staff, which has responsibility for assessing progress of individual students and meets at least twice a year, under the umbrella of the Board for Graduate Studies. At TAP meetings, students are required to present an overview of their progress and are asked to anonymously provide an assessment of their supervision and, if necessary, action is taken to address any issues. In addition we created and pioneered the use of Skillsforge for the monitoring and recording of research students' progress. As a consequence of the success of the system, Skillsforge is now in use across 12 universities in the UK to monitor student progression.

Training opportunities are offered to all PhD students throughout their studies by the Department (e.g. statistical techniques) and the University (e.g. Personal Development Programme). Providing essential skills and widening their experience for their future careers. Further opportunities include:

- Attending departmental research seminars;

- Presenting at research group seminars during their third year;

- Attending taught courses across the University;

- Attending University training courses in various areas such as IT and languages;

- Attending at least one international conference, funded by the Department;

- Attending at least one Summer School or visit to an institute, funded by the Department;

- Teaching and demonstrating providing experience in handling contact with students.

The quality of our PhD programme is reflected by the fact that the majority of our students secure employment in the electronics sector. Those who graduated in the period are now working either in academia (Lectureships: 14%; post-doctoral research positions: 26%) or business (60%).

d. Income, infrastructure and facilities

The assessment period has seen significant investment in our research infrastructure (£815,000) and facilities (£1.5 million). Related to more generic facilities (such as a rolling computing replacement strategy for all staff), there is provision of well established mechanical and electronic workshops and technician and Experimental Officer support in both electronics and computing supported by the Department (e.g. new 3D printing facilities for all groups).

Communications & Signal Processing Group (investment in period £150,000): <u>Recording studios:</u> Industry standard suites including control, live, digital audio workstation production, and practice rooms; <u>Listening room:</u> An acoustically treated 16 channel, 3D listening room facility for

auralisation and virtual acoustics research; <u>Media studio</u>: Professionally designed digital media suite providing industry standard media production and post-production tools; <u>A 6-sided acoustic anechoic room</u>.

Intelligent Systems (investment in period £600,000): <u>Virtual Environments Laboratory</u>: Facilities for medical diagnosis and assistive technologies; <u>Evolvable Hardware Laboratory</u>: Large-scale hardware development platform for research into biologically-inspired computing; <u>Robotics Laboratory:</u> 90m^2 purpose built laboratory equipped with multiple robotic platforms and visual tracking systems, joint ownership with Department of Computer Science. <u>Computer cluster:</u> for use with work on evolutionary algorithms.

Physical Layer (investment in period £750,00): <u>Applied EM test facilities</u>: screened room, reverberation chamber (200MHz-15GHz), anechoic chamber (1GHz-100GHz) and open-area test site facilities for conducting measurements from 10kHz to 100GHz; <u>Bio-molecular Electronics lab:</u> Facility equipped with a wide range of sample handling and characterisation equipment for biologically-functionalised electronic devices; <u>Clean room:</u> Fully equipped clean room facilities for the fabrication and characterisation of nano-scale devices; <u>Surface science and Electron-optics lab:</u> A range of commercial and bespoke equipment for the development of novel low energy electron guns and methods for the quantative analysis of nano-dimensional structures; <u>MBE growth lab:</u> Molecular beam epitaxy growth system which can make MOKE and magneto-elastic measurements in-situ; <u>York JOEL Nanocentre:</u> State of the art facility providing equipment enabling research in the areas of magnetic materials and measurements, surface analysis, magneto-optic properties of materials and spin electronic materials; <u>Molecular beam Epitaxy lab:</u> Housing the state of the art magnetic ultrathin film deposition system; <u>Ultra-low noise oscillator lab:</u> Facilities for the design, fabrication and characterisation of ultra low noise oscillators up to 50GHz.

Funding portfolio: Our funding comes from a variety of sources, including Research Councils (average of 51% over the period), UK government (average 10% over the period) European Commission (average 20% over the period, which constitutes a 7 fold increase over the period), industry (6% average over the period) 13% on average from other sources including charities and healthcare providers.

Future work in **Intelligent Systems** will benefit from the EPSRC Platform Grant funding where four areas have been identified for focus: Reconfigurable nano-scale analogue & digital design; Bio-inspired methods and techniques; Synthetic DNA, molecular machines and electronics; Adaptive many-core fault-tolerant architectures (additional supported through EPSRC SADEA funding). This core funding will allow these areas to be explored and additional funding sought. Future work in **Communications & Signal Processing** is designed to exploit recent funding successes: New paradigms for wireless networks, including Physical Layer Network Coding, underpinned by FP7 DIWINE and EPSRC Network Coding grants, with funding sought for massive MIMO. In cognitive and green communications, particularly for 5G heterogeneous networks, underpinned by funding from Huawei for energy efficient backhaul, ultra-high capacity networks from FP7 ABSOLUTE, with additional funding sought to strengthen these areas further. Future work in the **Physical Layer** group will be underpinned by our success in attracting funding from FP7 with HIRF-SE and STRUCTURES allowing development of our modelling and measurement capabilities in complex electromagnetic systems in vehicles and the built environment. We intend to exploit recent EPSRC funding to allow further development of novel electromagnetic metrology systems. Recently investment in network analysis equipment offers a significant enhancement of our metrology capabilities in all our measurement environments and also the interface with our modelling capabilities. *Everard's* RAEng research chair has enabled significant progress in oscillator design and new industrial funding is now allowing this to be exploited further.

Consultancy and professional services: Many of our staff have performed consultancy work and/or professional services during the assessment period, as examples: *Timmis/Tyrrell* for Dstl working on anomaly detection; *Murphy* for Roke Manor on acoustics; *Dawson* for Rainford and Lockheed Martin on Electromagnetic measurements; *Marvin* is a Working Group member of the National Measurement System Research & Development Metrology and of the National Measurement System Materials Metrology Programme for the Department of Business, Innovation and Skills; *Marvin* was Co-Convenor of the IEC/CISPR Joint Task Force on TEM Waveguides for EMC Measurements; *Everard* for HCD Research Ltd on crystal oscillator design; *El-Gomati* for

Shimadzu Corp, Japan on new electron cathodes; *Xu* for Technology and Innovation Futures project, by the Office for Science, UK and appointed Member of the Advisory Board to the Nantong City Government, China.

e. Collaboration or contribution to the discipline or research base

A great deal of our work is, by nature, interdisciplinary and collaborative:

At an **international level**, for example, as the co-director of the York-Nanjing joint center for spintronics, *Xu* works closely with Nanjing University, supported with travel funds from the Department in developing spintronic materials based on GaN. As a result of the collaborations it was possible to fabricate a new class of spintronic material. Work by *Smith,* supported with flexible working arrangements from the Department, in collaboration with clinics in the USA, Australia and UAE has led to clinical trials of novel diagnostic technologies for neurodegenerative diseases. *Grace*, with travel and equipment funded from the Department, is leading development of York-Zhejiang Lab for Cognitive Radio and Green Communications.

At a **national level**, for example *Halliday* has a long-standing collaboration with the National hospital, where his contribution is in the form of multivariate statistical signal processing for analysis of data sets, with travel funding supported by the Department. *Tyrrell* has strong collaborations with the Physics at Oxford supported initially by EPSRC, but continued by the Department, which lead to the creation of the first Clocked DNA finite-state-machine. *Hirohata*, through an EPSRC Critical Mass Grant and Departmental support works with Leeds and Sheffield, to create a world-leading nano-fabrication facility.

At the **local level**, for example, there are strong collaborations between Biology where *Timmis* has helped develop novel modelling approaches to understand the role of cell types in inflammatory responses in the immune system, complementing wet-lab experiments (partly funded by BBSRC and the Department); *Robinson* collaborates with Biology and Leeds teaching hospitals and the University of Leeds on assessment of body composition and techniques for manipulation of cell membranes.

Such interactions have led to significant successes; we have reflected on these successes and used these to inform the development of our research strategy. For example, the clinical success of the work by *Smith* in diagnosis of neurodegenerative diseases and modeling work of *Timmis* in immunology has helped identify healthcare a focus over the coming five years.

Exemplars of leadership in the academic community:

El-Gomati was awarded OBE for "services to science" 2012 and the Fazlur Rahman Khan award for Science and Engineering 2009; *Marvin* was elected to Fellowship of Royal Academy of Engineering 2011 and Fellow IEEE 2010; *Tyrrell* chairs and *Trefzer* co-chairs the IEEE task force on evolvable hardware; *Timmis* is a member of IEEE task force on bio-inspired self-organising collective systems; *Tyrrell* is a member of IEEE Evolutionary Computation Technical Committee; *Grace* is chair of IEEE Technical Committee on Cognitive Networks 2013-14; *Marvin* is vice-chair of the IEEE Standard 299.1 Working Group (Shielding Effectiveness of Enclosures); *Halliday* is co-chair of the UK Neuroinformatics special interest group in Electrophysiology; *Grace* established and is Chair of WUN Cognitive Communications Consortium - 270 members worldwide.

Conference programme chairs: All members of staff review for conferences. Academics also play a leading role in conference organisation, including: *Tyrrell* as general chair of IEEE Congress on Evolutionary Computation (2009); *Mitchell* & *de Lamare* as general chairs of the IEEE International Symposium on Wireless Communication Systems (2010); *Timmis* as general chair of International Conference on Artificial Immune Systems (2009); *Marvin* as general chair of EMC Europe Conference (2011); *Murphy* as general chair of the International Conference of Digital Audio Effects (2012); *Smith* is co-founder and organizer of the Genetic and Evolutionary Computing Conference, MedGEC Workshop, since 2004; *Everard* as Tutorial Chair for the European Frequency and Time Forum (2012/13/14).

Invited lectures and keynotes: At international conferences, including: *Timmis* - International Conference on Unconventional Computing, Austria (2008); *Tyrrell* - International Workshop on Information Processing in Cells and Tissues, Switzerland (2009); *Howard* - Afrigraph, Pretoria

(2009), Voice Science Symposium, Portugal (2010); *Miller* - International Workshop on Nature Inspired Cooperative Strategies for Optimization, Spain (2010). *Murphy* - Audio Engineering Society, Portugal (2010); *Xu* - International Symposium on Spintronics Devices and Commercialization, Beijing (2010); *de Lamare* - MOBICOM, Austria (2012); *Grace* - IEEE International Symposium on Wireless Communication Systems, France (2012).

Journals editorship: 20 staff hold Editorship positions on journals. These include: IEEE Trans on Evolutionary Computation (*Tyrrell*); IEEE Trans on EMC (*Marvin*); IEEE Communications Letters (*Burr*); IEEE Trans Signal Processing (*de Lamare*); Optical and Quantum Electronics (*Avrutin*); Journal of Physics D (*Hirohata*); Natural Computing (*Timmis*); Journal of Voice (*Howard*); Genetic Programming and Evolvable Machines (*Smith, Miller, Tyrrell*); IET Wireless Sensor Systems (*Mitchell*); Springer "Handbook of Spintronics", Editor-in-Chief, (*Xu*).

Visiting positions*:* Include: *Timmis* is Visiting Professor at National University of Malaysia (from 2009); *Hirohata* is visiting professor at Tohoku University, Japan (from January 2009); *Tyrrell* was visiting Researcher at National Institute of Advanced Industrial Science and Technology, Japan (2009); *Grace* is guest Professor at Zhejiang University, China (from 2012); *Howard* is Adjunct Research Professor at University of South Australia (from 2005); *de Lamare* is visiting professor Pontifical Catholic University, Rio, Brazil (from 2013)*; Xu* is visiting professor Nanjing University, China (from 2012)*; Johnson* is visiting scientist, Leeds University (from 2012); *Murphy*, visiting researcher at Aalto University, Finland (2009, 2011, 2012).

Prizes and best papers*: Miller* (Evostar outstanding contribution to evolutionary computation in Europe award 2011); *El-Gomati* (Microbeam Analysis Society - The Cosslett award 2009); Best paper - nominations: *Tyrrell* (CEC 2013); *Trefzer, Tyrrell & Miller* (GECCO 2010). - awards: *Burr* (European Wireless, 2010); *Marvin, Dawson & Everard* (IEEE Symposium on EMC, 2013); *Grace* (IET Communications, 2012, 2013); *Timmis* (ICARIS 2011); *Hirohata* (MMM-INTERMAG, 2013); *Howard* (HCI International, 2013); Mitchell (IEEE NESEA 2012); *Mitchell* (IET CCWMC 2009).