Institution: Liverpool John Moores University

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

1. Overview

Research in UoA 13 takes place within the School of Engineering, Technology and Maritime Operations, which is a part of the Faculty of Technology and Environment. The research is conducted within the 'Research Centre for Electrical and Electronic Engineering – RCEEE'. RCEEE is a dynamic research centre, which occupies a unique international position despite of its limited size. It brings its specialist skills to a number of international partnerships with world-leading laboratories, thus demonstrating its ability to contribute to the forefront of the field at a level of significance that is far beyond what its size may initially indicate. In the current submission we include all seven RCEEE academics, which constitute two research groups: Microelectronics (RG1) and Electric Machines and Drives (RG2). This includes the two group leaders, ZhangJ and Levi, respectively, who are both Professors, two Readers (ZhangW in RG1 and Jones in RG2), and three Early Career Researchers (ECRs: Ji and Benbakhti in RG1, and Dordevic in RG2). Each area has been significantly strengthened during the assessment period, enabling the number of submitted staff to increase 3.5 times, compared to RAE2008. In addition to the seven academics, the personnel of the two research groups currently include two post-doctoral researchers and seven PhD students (nine in total).

2. Research strategy

This UoA submission in the RAE2008 stated four strategic objectives: i) continuation of the expansion of the two research groups by appointment of new academic staff; ii) enhancement of the profile and activities of other two academics who were not submitted (ZhangW and Jones); iii) an increase in the number of PhDs awarded and provision of sufficient research funding; and, iv) further strengthening of existing and establishment of new research collaborations with leading international partners. These have all been successfully achieved, since:

- The total number of academics has increased from 4 to 7, with an increase in the submitted number of academics from 2 to 7;
- Two academics, not submitted in 2008, have both been promoted to Readerships (Jones and ZhangW);
- The number of awarded PhDs has increased from 8 to 14;
- Four major research grants have been obtained, three from the EPSRC and one from the Qatar National Research Fund (QNRF): EPSRC grants EP/I012966/1, £462k, and EP/L010607/1, £517k in RG1; and, EP/I038543/1, £333k and QNRF NPRP 4-152-02-053, $ 287k in RG2. The total value is approximately £ 1.5M;
- Existing international research collaborations have been successfully continued and new links have been established, as evidenced in section 5;
- Submitted academics have authored a total of 44 IEEE Transactions papers in the relevant six-year period, 19 of which are submitted for evaluation.

The senior academics have also substantially enhanced their international standing through elevation to the IEEE Fellow grade, various IEEE awards, appointments to editorships of major international journals, delivery of Keynote conference papers, etc. (section 5). All these achievements have enabled the RCEEE to play a significant role in the international arena in the areas of "Multiphase and multi-motor drive systems" (Electric Machines and Drives) and "Qualification of VLSI devices and materials" (Microelectronics), as evidenced further on. A comparison of some of the main numerical indicators in RAE2008 and REF2014 is given in the table.

	RAE2008	REF2014
SCI journal papers	66 (including 32 IEEE/IET/IEE and 12 AIP/IOP papers)	73 (including 44 IEEE Transactions and 6 IEEE Letters papers)
PhD completions	8	14

The RCEEE prides itself with its publication record, which is believed to be of exceptional quality and quantity, considering the number of academics in the RCEEE. A complete breakdown of the published output during REF period is given in the table on the research group basis.

	RG1	RG2	RCEEE
IEEE Transactions	20	24	44
IEEE Letters	6	-	6
Other SCI journals (inc. IET, AIP/IOP)	17	6	23
Other refereed journal papers	3	2	5
Full refereed conference papers	29 (inc. 8 at IEEE IEDM)	51	80
Other full conference papers	1	6	7
Book chapters	1	2	3
TOTAL	77	91	168

The University, Faculty and the School believe that their long-term viability can only be assured if underpinned by world-class research and have therefore invested significant resources in people and infrastructure of the RCEEE (sections 3 and 4). Our strategy, underpinned by the University's Strategy Map 2012-17 that has research excellence and development of the research environment as the core aims, in the forthcoming period will therefore centre on:

- Continuation of expansion of the existing research groups in the RCEEE, by appointment of new academic staff in accordance with the School's strategic plan (section 3.1);
- Enhancement of the research profile and activities of the ECRs and researchers at the medium stage of their career;
- Increase in the number of PhD completions and provision of sufficient external research funding, as well as internal funding for PhD studentships, equipment and conference travel;
- Continuation of existing and establishment of new research collaboration with leading international partners;
- An expansion of the collaboration with industry, both directly and indirectly through partnerships on externally funded research projects, with the view of maximising the impact of the research.

The research strategy regarding external funding will remain as in the REF period. External funding will be sought from the EPSRC and international grant awarding bodies, the policy being to submit relatively few but very original applications, with potential for high impact, and thus achieve a relatively high success rate. Additional funding will also continue to be provided through internally funded PhD studentships. Future research topics will be selected using the following two criteria: i) the solution to a problem must advance the level of fundamental knowledge and understanding on an international scale; and, ii) the topic must address the challenges faced by the industry, in order to achieve the impact. In RG1, the research will focus on developing novel characterisation techniques for qualification of VLSI devices and circuits, aiming to provide tools for the circuit design, an area where the UK has a growing industry. In RG2 it is envisaged that the main focus in the next five years will be on innovative research topics, related to multiphase electric power generation and power electronics, areas in which the group has achieved substantial international reputation during the REF period.

3. People, including:

3.1 Staffing strategy and staff development

The School has been and will remain to be committed to strengthening further the core research groups within the RCEEE, by recruiting high-quality early-career academics. This commitment has resulted in the employment of Ji in 2011 as an ECR. A further substantial boost to the staffing of the RCEEE has been given by the University's strategic investment into high-quality research staff, the 'Inspire' campaign, which enabled recruitment of Benbakhti in 2012 and Dordevic in 2013. Staffing strategy has thus enabled an increase of the academic numbers in the two RGs from 4 to 7, with an increase of the number of submitted staff from 2 to 7. Hence the planned increase in staff numbers in RAE2008, from 4 to 6, has actually been exceeded. The School is committed to recruiting at least one more academic in the RG2 areas in the forthcoming period.

The School operates a mentoring system for new academics. Senior staff members (typically, research group leaders) are assigned as mentors and their main duty is to facilitate integration of young academics into the existing research culture and to help them to commence a successful research career. The School provides a PhD studentship for the new academics and the Faculty Research Fund gives preference to their research project bids. New academics typically have a substantially reduced (50% maximum) teaching load during the first two years. The

School operates a Conference Travel Fund, which provides funding for academics to present research at the leading international conferences. Progress of the research is monitored at School level through annual research activity survey and the Personal Development and Performance Review, which inform the workload allocation model. This leads to a reduced teaching load for research-active staff at all stages of their research career, as well as an identification of the development needs.

Research is recognised and encouraged by the University's promotion policy through an annual call for conferment of Professorships and Readerships. In the RCEEE, ZhangW and Jones were promoted to Readerships in 2010 and 2011, respectively. The University has also established the 'Early Career Fellowship Fund', operated on an annual basis by the Research and Innovation Services through the Director of Research, which enables early career researchers to take a sabbatical leave in order to spend time building their research career in the leading international centres of excellence. The beneficiaries of this scheme in the REF period have been ZhangW, who spent six months in 2008 in IMEC (Inter-University Microelectronics Research Centre in Leuven, Belgium) and Ji (arranged six months stay in the first half of 2014 at the same institution). Further support for research active staff is provided at the Faculty level through an annual competitive Call for Bids, where the preference is given to applications submitted by the ECRs. Financial research support at the School level comes in the form of PhD studentships (section 4), financing of equipment (section 4), and financing of conference travel for both PhD students and academics.

The University's overall research framework and strategy during the REF period have been formulated and managed by the Director of Research (based in 'Research and Innovation Services') and implemented through Faculties. The Research and Innovation Services provide leadership for staff within the University and quality assurance support for research and PGR programmes. In addition to its Code of Practice for Research, the Research and Innovation Services operates formal protocols/procedures for research governance and the investigation of alleged misconduct in research. Additionally, core principles and expectations with regard to the curation of publically-funded research data and research outputs are explicit in the University's research data management policy. Research at the Faculty level is monitored and managed by the Faculty Research Committee, which is also in charge of the distribution of the Faculty Research Fund. The School Research Committee develops and implements the research strategy, distributes the School's research funds, and deals with post-graduate student admission. The School promotes research in UoA13 through the RCEEE with its two constituent research groups, whose leaders are actively involved in all research-related strategic decisions at the School level.

The University's Research and Innovation Services run a series of informal induction events for new research active staff, including early career researchers (on average four times each semester). Held in different locations across campuses, these events provide an opportunity for new starters to meet with existing research staff. A broad overview of the professional services, provided by the University to support research activity, is given, alongside the policies and procedural frameworks that underpin research at the University (e.g. research strategy, grant funding and support, research ethics, library resources, REF, Researcher Development Framework). The University also provides a range of career/skills development opportunities, targeted specifically at early careers researchers, such as for example 'Being an Effective Researcher'. The University's Research and Innovation Services provide a range of research-related training, skill development and networking opportunities for staff at all levels of experience and capability. It also disseminates information about internal and external training opportunities in a dedicated electronic research bulletin. Internal regularly organised training events include:

- Grant bid clinics (two-day events for principal investigators who are targeting competitive funding streams; attendees will generally have quite well-developed research proposals that would benefit from in-depth peer review to enhance quality prior to submission);
- Grant Incubator workshops (for researchers seeking guidance on how to develop their research ideas into more formal proposals);
- Research grant training (comprehensive training on all aspects of proposal development for those new to research and/or the University).

The University is an active and committed member of the UK Vitae North West Hub, mapping its training provision against the Researcher Development Framework (RDF). As well as supporting researchers to attend Vitae skill development and networking events, the University

hosts Vitae workshops that are open to researchers from other institutions.

The University was awarded the European Commission's HR Excellence in Research award in May 2012. The University has a robust action plan to continue to support researchers and researcher development which is delivered through the Concordat Task Group and overseen by the University's Research and Scholarship Committee. The RDF and the Concordat principles are at the heart of this action plan.

Academic appointments and promotions to Readership and Chairs are routinely monitored (equality impact assessment) and reported in terms of equality and diversity. The University holds membership of the Athena SWAN Charter and is working towards achieving the Athena SWAN Bronze award by April 2014, in accordance with its Equality Objectives and Action Plan 2012-2017.

Visiting scholars in the RG2 have included academics and PhD students from three Spanish Universities: Dr O. Lopez and Dr A. Yepes from the University of Vigo (three months each, 2008 and 2011, respectively); Dr M.J. Duran, University of Malaga (three months, 2012), Prof. Federico Barrero of the University of Seville (three months, 2009; 1.5 months, 2010; three months, 2012; four months, 2013), Dr J. Riveros and Mr J. Prieto, both at the time of their visits PhD students at the University of Seville (Prieto: two three months stays, 2009 and 2010; Riveros – three months, 2011). A further research stay was accommodated for Mr. M. Rolak (a PhD student at the Warsaw University of Technology, Poland; six months, 2012-2013) and for Prof. M. Aware of Visvesvaraya National Institute of Technology, Nagpur, India (Commonwealth Fellowship, funded through the British Council; six months, 2010-2011). The RG1 has hosted Prof. Runsheng Wang, from Peking University (PR China) for two days in 2013: he delivered a research seminar, research collaboration was discussed, and a joint PhD student supervision was agreed.

3.2 Research students

Postgraduate research students are typically recruited by advertising the posts (when these are accompanied by a studentship) or through direct application of overseas fully funded students to the University. For all research students there is an induction session; it is compulsory and is provided by the University's Research and Innovation Services (induction sessions are run on six occasions throughout the academic year). All research student supervisors are required to complete the University's Research Supervisors workshop. Quality assurance and progress monitoring for PhD students are provided via a two-tier system, at the Faculty level (Faculty Research Committee) and the University (Research Degrees Committee).

All research students are encouraged to complete the Postgraduate Research Experience Survey (PRES). The data are analysed at the Faculty level and are made available at School level. If and when deficiencies are detected, appropriate action is taken.

Research and Innovation Services manage (from 2011-12) a conference travel fund specifically to enable eligible postgraduate research students to attend a conference in the UK or overseas and disseminate the findings of their research. In the 2011-2013 period seven PhD students of the Electric Machines and Drives group and two from Microelectronics have been awarded the funding. The complement to the total conference travel cost is provided by the School.

The University's Research Degree Regulations require that all registered postgraduate research students and their Directors of Study report annually on progress in line with the University's Code of Good Practice for Annual Monitoring. Annual Monitoring reports are collated at Faculty level and reported to the University Research Degrees Committee. All postgraduate students in the RCEEE have progressed well in the REF period, with a typical average completion period being 42 months. Students who progress exceptionally well are encouraged to prepare research papers and attend two to three international conferences, with financing provided from the relevant research projects, School and/or University's conference travel fund, as appropriate.

All research students of the RCEEE are expected to present their research findings at various internally organised events at the University/School level and, as a minimum, at one international conference (in the UK or overseas). Internal events include 'Research Cafe', run by the University and aimed at non-specialist audience (organised since late 2012 on average four times per semester; five research students from the RCEEE have presented at these events), and School Research Seminars, aimed at a more specialist audience (organised once per year).

The University signed a Memorandum of Understanding with the University of Malaya (Kuala Lumpur, Malaysia) in 2009, related to the organisation and delivery of a joint PhD degree. The first

three Malaysian students (financed by the University of Malaya), who commenced their part of research studies at the University in 2011 on this programme, are all in the RCEEE – two of them successfully completed in July 2013, both from the RG2.

4. Income, infrastructure and facilities

External research income in the REF period has continued to be provided predominantly through the EPSRC research grants. In Microelectronics, two EPSRC grants have been completed in March 2008: "Stress-Induced Leakage Current (SILC) in Thin Gate Oxides of MOSFETs", EP/C508793/2, PI: ZhangW (£ 124k); and, "Performance, degradation and defect structure of MOS devices using high-k materials as gate dielectrics", EP/C003071/1, PI: ZhangJ (£ 191k). The former one was the First Grant Scheme project, while the latter one was a joint project with The University of Manchester and the University of Liverpool, supported by Inter-University Microelectronics Research Centre (IMEC, Belgium) and International Sematech (USA). The key advance included developing a framework for positive charges in Hf-based dielectric stack and Dr Groeseneken (Fellow of the IMEC) highlighted that the identification of the dominant layer for device instabilities by RG1 researchers impacted the development work of the industrial consortium for Logic Devices. The outcome of the project led to six invited papers at international conferences, including one invited and chaired by Prof. Robertson of the University of Cambridge.

Two major new EPSRC grants have been awarded during the REF period: "High permittivity dielectrics on Ge for end of Roadmap application", EP/I012966/1, 01/04/2011-30/09/2014, £ 463k, PI: ZhangJ; and, "Time-Dependent Variability: A test-proven modelling approach for systems verification and power consumption minimisation", EP/L010607/1, awarded in July 2013, 48 months, planned to start in January 2014, £517k, PI: ZhangJ. The former one is a joint project with the Universities of Liverpool and Cambridge and is supported by IMEC. The key advance up to now includes developing a new energy-switching model for Ge transistors and a new device lifetime prediction method, which has already led to four invited presentations. In the latter one the group teamed up with Prof. Asenov of Glasgow University and the work is supported by two major UK companies, Arm Ltd and Cambridge Silicon Radio (CSR) Ltd. One reviewer of the proposal commented in the report 'The project has been configured to generate impact.'

Electric Machines and Drives research group is part of a multi-university consortium working on the EPSRC's "Vehicle electrical systems integration - VESI" project, EP/I038543/1, 01/10/2011-30/09/2015 (RG2 allocation: £ 333k, PI at the University is Levi). The second major grant in the RG2 has been awarded by the Qatar National Research Fund for work on the project NPRP 4-152-02-053 "Advanced power electronic solutions for variable-speed multiphase ac motor drives", 01/04/2012-31/03/2015 in partnership with Qatar University and Texas A&M University at Qatar (RG2 share is $ 287k; PI: Levi, CI: Jones). Within the EPSRC VESI project, the RG2 is investigating suitability of using multiphase machines to fully integrate the complete power electronic converter system and the motor into the on-board battery charging system. The idea is to enable use of exactly the same system in the battery charging mode, vehicle-to-grid (V2G) operation and the propulsion mode, while having natural zero-torque operation in charging and V2G modes and, preferably, no requirement for the hardware reconfiguration between the modes. Numerous original and feasible solutions had been already devised so far and the RG2 has been designated to lead one of the three demonstrators that will be used to showcase the project achievements in the forthcoming period. The role of the RG2 in the QNRF financed project NPRP 4-152-02-053 is to develop new pulse width modulation techniques for multiphase machines, supplied in single-sided mode using three-level multiphase inverters and supplied with a dual-inverter system in the open-end winding configuration. The project has progressed exceptionally well and some of the outputs submitted for evaluation are a direct outcome of the project.

The total spent external research income in the REF period was approximately £ 440k. However, substantial research funding has been secured and will be carried over into the next time period (just over £ 1M), as is obvious from the project time scales and grant values, given above.

In addition to the externally funded research projects, a significant amount of the research expenditure has been provided from the internal School funds. In particular, the School has financed four full PhD studentships at international student level at a cost of approximately £ 100k per annum in the period 2009-2013 (£ 500k in total). All four students have successfully completed in 2013 and four new international students will commence their studies in the early 2014, financed in the same manner.

RCEEE operates in two dedicated research laboratories, one per group. The Electric Machines and Drives laboratory was refurbished during RAE2008 period, while the refurbishment of the Microelectronics laboratory took place in 2012. Both laboratories are equipped with the most-up-to-date research equipment. The two research groups have in the REF period significantly benefited from the RCIF funding and further internal School investment. The Microelectronics laboratory has acquired wafer level microelectronic probe stations and accessories, at a cost of £ 200k (funding source: RCIF) and semiconductor analysing equipment of £ 110k value (funding source: EPSRC project). The Electric Machines and Drives laboratory acquired made-to-order three-level six-phase inverters and two-level eight-phase inverters (two each) at a cost of £ 50k provided from RCIF. Existence of this equipment was instrumental in securing research funding from the Qatar National Research Found (NPRP 4-152-02-053 grant, described above). Further important additions to the equipment have been two Sorensen SG1 600/25 15kW dc power supplies (£ 35k), a Spitzenberger PAS2500 based three-phase grid emulator system with a programmable load and interface unit (£ 33k), ABB four-quadrant ac and dc drives (£ 10k), and advanced measurement equipment (dynamic signal analyser, mixed signal scope, current and high voltage differential probes, a deep memory scope, power meters, etc., app. £ 15k). Financing came in part from RCIF and in part from the internal School funds and totalled app. £ 150k. These additions to the already existing laboratory equipment have further contributed to the unique nature of the Electric Machines and Drives group as a centre of excellence for research in the area of multiphase drives and power electronics, and have led to a significant number of visiting scholars and PhD students from leading European Universities (please see section 3.1 for details).

Post-graduate students of the RCEEE are housed in separate offices, typically two to four in a room. Their grouping is in accordance with the research groups, which enables interaction and exchange of ideas between students.

5. Collaboration and contribution to the discipline or research base

One of the main characteristics of the research within the RCEEE has always been a substantial degree of international collaboration, in addition to joint work at national level. Collaborations are based on complementary expertise of the partners. Research directions are set by the awarded externally funded projects, by overseas partners, or by the submitted academics, as appropriate.

In RG1 collaboration with the world leading research centre, IMEC, commenced in 1993. IMEC has been a collaborator for all EPSRC research projects and most of the papers have been co-authored by IMEC staff. The quality of collaboration with the IMEC is best evidenced by quoting Dr Groeseneken, a Fellow of IMEC: “We have collaborated with many universities and we rate Liverpool John Moores University as one of our top University partners” (full statement available at http://www.ljmu.ac.uk/ENG/ENG_Docs/C2.7_-_Statements_from_IMEC_on_Mobility_Case.pdf). In the REF period collaboration has continued with IMEC, Katholieke Universiteit Leuven (Belgium), Xidian University (PR China), as well as with the University of Liverpool and The University of Manchester. New collaborations have commenced with the University of Malaya (Malaysia), Nanyang Technological University (Singapore), Singapore Institute of Manufacturing Technology, Institute of Microelectronics at the Chinese Academy of Sciences (PR China) and South University of Science and Technology (PR China), as well as with the University of Cambridge, University of Glasgow and Swansea University. Industrial collaboration, in the form of EPSRC project support, has continued with International Sematech (USA) and the industrial consortium for Logic Devices based at IMEC. New industrial companies, with whom collaboration has been established since 2008 and who are partners at the EPSRC projects, include Arm Ltd (UK), Cambridge Silicon Radio (CSR) Ltd (UK), Umicore (Belgium), Safc Hitech (UK), NXP Semiconductors (UK), Micron Technology Inc. (USA), Samsung (South Korea) and the industrial consortium for Memory Devices based at IMEC. Direct collaboration has also been established with Keithley Instruments (USA), a part of the Tektronix group. The collaboration takes many forms, including progress meetings, supply of the test samples by industrial partners, use of partner facilities, exchange of PhD students, direct engagement with the companies (e.g. Keithley Instruments), etc. The published output of the group includes 17 IEEE Transactions papers, co-authored with overseas researchers (15 are with staff of IMEC and the Katholieke Universiteit Leuven, while the other two are with academics from Singapore and Chinese institutions, listed above). Joint output has also been published with the employees of Keithley.

The RG2 has continued to collaborate with Texas A&M University (College Station, USA),

Indian Institute of Science (Bangalore, India), University of Bologna (Italy), University of Seville (Spain), University of Plzen (Czech Republic), and University of Belgrade (Serbia). New collaborations have been established in the REF period with the University of Vigo (Spain), University of Malaya (Kuala Lumpur, Malaysia), University of Malaga (Spain) and Qatar University (Doha, Qatar). The main characteristic of all these collaborations is a joint published output, typically in IEEE Transactions. With regard to industry, the main collaborating companies in the REF period have been ABB-Switzerland and Infineon-Germany. Joint published output has been produced with employees of both companies and they are also industrial partners in the EPSRC "Vehicle Electrical Systems Integration" (EP/I038543/1) project (their support has been secured through the Electric Machines and Drives research group). Overall, the published output in the REF period includes 14 IEEE Transactions and three other SCI-journal papers with international co-authors, as well as numerous conference papers.

ZhangJ serves as an Editor for the Electrochemical Society Transactions (USA): Dielectric and Semiconductor Materials, Devices, and Processing. He is a member of the technical programme committee for IEEE International Electron Devices Meeting (IEDM) (the flagship meeting in this area, held annually in the USA), The Electrochemical Society's Biennial Int. Symposium on Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics (USA), China Semi-conductor Technology International Conference (CSTIC), and the IEEE Int. Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA). ZhangJ has reviewed research grant proposals for the Singapore and Irish Science Councils. He was appointed an external PhD examiner at the Nanyang Technological University (Singapore) in 2009 and 2010. ZhangJ and his team have authored seven invited conference papers and one invited book chapter.

Levi serves as a Co-Editor-in-Chief of the IEEE Trans. on Industrial Electronics (since 2009), as the Editor-in-Chief of the IET Electric Power Applications (since 2010), and as an Editor of the IEEE Trans. on Energy Conversion (since 2007). He served as the Technical Programme Chair for the EPE-PEMC 2012 ECCE Europe conference (Novi Sad, Serbia, 2012) and as the Guest Editor of the Special Section on "Multiphase Machines and Drives" (IEEE Trans. of Industrial Electronics, May 2008) and the Special Issue on "Electric Machines and Drives in Emerging Applications" (IEEE Trans. on Industry Applications, December 2012). He is a member of the EPSRC Peer Review College and he was an expert reviewer for the National Agency for the Evaluation of Universities and Research Institutes (ANVUR) of Italy in 2012 research quality assessment for the period 2004-2010 ("eValuation of Quality of Research"). Further, he has served as an expert reviewer of the research project proposals for the Czech Science Foundation, Ministry of Education, Science and Sport - Slovenia and the Ministry of Education and Science - Serbia. He has served as a member of the EPE Int. Steering Committee and a Topic Chair for the EPE 2013, EPE 2011, and EPE 2009. Levi has authored two invited original research journal papers (in IEEE Trans. on Energy Conversion – submitted output no. 2, and in IEEJ Trans. on Electrical and Electronic Engineering, 2009). He has delivered Keynote papers at the IEEE Int. Electric Machines and Drives Conf. (IEEE IEMDC, Chicago, 2013) and at the Int. Conf. on Renewable Energy Research and Applications (ICRERA, Madrid, 2013). He was a reviewer for Professorial appointments worldwide (North Carolina State University, USA, 2013; Purdue University, USA, 2013; Universite Lille 1, France, 2012; Ben-Gurion University of Negev, Israel, 2012; University of Aberdeen, Scotland, 2012; Penn State Altoona University, USA, 2011; University of Montenegro, Montenegro, 2011; University of Sheffield, 2010; Politecnico di Torino, Italy, 2008).

Levi has been elevated to the grade of IEEE Fellow in 2009, "for contributions to vector control of induction motor drives". He has received the Cyril Veinott Electromechanical Energy Conversion Award from the IEEE Power and Energy Society for 2009 "for contributions to modelling and control of induction machines", and the Best Paper Award of the IEEE Trans. on Industrial Electronics for the 2008 paper "Multiphase electric machines for variable-speed applications" (vol. 55, no. 5, pp. 1893-1909), which has become a landmark paper in a very short period of time (01/11/2013: 193 citations in WoS, 396 in Google Scholar). Levi has authored two invited chapters in "The Industrial Electronics Handbook: Power Electronics and Motor Drives," (Editors: B.M.Willamowski and J.D.Irwin, CRC Press, 2011).

Jones and Dordevic serve as regular reviewers for various IEEE Transactions and IET Electric Power Applications. ZhangW, Ji and Benbahti serve as regular reviewers for IEEE Transactions and Solid State Electronics.