

Faculty of Engineering and Technology

November 2019

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£460k allocated to LJMU, 'Probing the Cosmological Universe with Lensing, CMB and 21cm Data, **Dr. Joachim Harnois-Deraps**. STFC Ernest Rutherford Fellowship, 2020-2025.

£575k allocated to LJMU, Using drones to protect biodiversity and spur economic growth in Madagascar, **Prof. Steve Longmore (PI), Dr. Paul Fergus, Dr. Carl Chalmers, Dr. Fred Bezombes**, Prof. Serge Wich and

Dr. Owen McAree. EPSRC GCRF Global Research Translation Awards, October 2019 – March 2021.

BEST

US \$600k allocated to LJMU, Development of non-invasive diagnostic tool for lymphatic filariasis microfilariae detection **Dr. Patryk Kot (PI), Prof. Andy Shaw** and **Dr. Magomed Muradov**. FET as Co-I in a total grant \$1.3m, led by Liverpool School of Tropical Medicine. Gates Foundation, 2019-2022.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(APM/PROTECT) **Prof. Paulo Lisboa** (APM) and **Dr. Hoshang Kolivand** (PROTECT) both delivered [keynote presentations](#) at the Developments in eSystems Engineering (DeSE) conference, Kazan, Russia, 7-10 October 2019. Prof. Lisboa's address was titled "A Machine Learning in Sports Analysis" and Dr. Kolivand's presentation was titled "A Glimpse of Future Immersive Technologies using Virtual and Augmented Reality".

(PROTECT) **Dr. Hoshang Kolivand** delivered a [keynote speech](#) at International Nanotechnology and Nanoscience Conference (OLC Nanotechnology-2019), Chicago, USA September 23-24, 2019 entitled "Current and Future of Virtual and Augmented Reality in

Nanotechnology". Dr. Kolivand also delivered a keynote speech at International Conference on Engineering Technology & Applied Sciences entitled "Current and Future of New Immersive Technology", Dubai, September 18th -19th 2019 UAE, 2019.

(LOOM) **Prof. Jin Wang** delivered a keynote address "Risk-based decision making in design and operation of large engineering systems under uncertainties" at the 11th International Conference on Information Management and Engineering (ICIME 2019) & 2019 2nd International Conference on Information Hiding and Image Processing (IHIP 2019), British Computer Society, London, 19-21 September 2019.

RESEARCH IMPACT GENERATING ACTIVITIES

(ARI) **Dr. Claire Burke** was an invited speaker at ['New Scientist Live'](#), a major event in public engagement for STEM subjects, to talk about "Using drones for good".

The event took place at the ExCel in London, 15th-18th October.

REF UPDATE

An internal review of research outputs is taking place in November 2019. If you have any questions, please contact your relevant UoA coordinator:

- UoA 9 Physics (Prof. Paolo Mazzali)
- UoA 11 Computer Science and Informatics (Prof. Qi Shi)
- UoA 12 Engineering (Prof. Jin Wang)
- UoA 13 Architecture, Built Environment and Planning (Prof. Andy Shaw).

EXTERNAL COLLABORATION

(EEE) **Dr. Qian Zhang** welcomed **Zhi Yuan** of Wuhan University of Technology School of Navigation, China, for a twelve month research visit.

(GERI) **Dr. Guangming Zhang** is hosting three visitors from University Malaysia Perlis. Dr. Rita Mohd Said, Nur Syahirah Mohamad Zaimi and Marliza Binti Mostapha will work with GERI until the end of 2019.

(PROTECT) Dr. Rajen Vohra of Data Analytics & Machine Intelligence Research Group, India, has commenced a twelve month collaborative visit hosted by **Prof. Abir Hussain**.

In September 2019, **Prof. Qi Shi** welcomed three visitors from Le Quy Don Technical University, Vietnam: Phai Vu Dinh, Dr. Tran Nguyen Ngoc and Tu Tran Tuan.

Dr. Thar Shamsa hosted Dr. Asad Khattak of Zayed University, UAE, for a collaborative visit in October 2019.

Dr. Hoshang Kolivand organized the first international conference on Applied computing to support industry: Innovation and technology (ACRIT 2019), September 15th – 16th, 2019, Ramadi, Iraq as co-chair of the conference.

NOTABLE PUBLICATIONS

(ARI) **Burke, C., McWhirter, P.,** Veitch-Michaelis, J., McAree, O., **Pointon, H.,** Wich, S. and **Longmore, S.** (2019) "Requirements and Limitations of Thermal Drones for Effective Search and Rescue in Marine and Coastal Areas", *Drones*, 2019, 3(4), 78, [DOI](#).

(EEE) **Chai, Z., Zhang, W., Hatem, F., Zhang, Freitas, J. F. P., Marsland, J.,** et al. (2019) "Dependence of switching probability on operation conditions in GexSe1-x ovonic threshold switching

selectors," *IEEE Electron Device Letters*, Vol. 40, No. 8, pp.1269-1272, [DOI](#).

(GERI) Jamal, M., and **Morgan, M.N.** 2019. 'Characterisation of Material Properties Based on Inverse Finite Element Modelling', *Inventions*, 4(3), 40, [DOI](#).

(LOOM) **Wan, C., Yan, X., Zhang, D., Qu, Z. and Yang, Z.** (2019) "An advanced fuzzy Bayesian-based FMEA approach for assessing maritime supply chain risks, *Transportation Research Part E: Logistics and Transportation Review*, Vol. 125, pp. 222-240, [DOI](#).

OTHER ITEMS

(PROTECT) **Dr. Alessandro Raschella** is organizing, as Guest Editor, a Special Issue of the journal *Computer Networks*, "Special Issue in Smart Spectrum and Radio Resource Management for Future 5G Networks". The [call](#) is open for submission.

(LOOM) **Dr. Dimitrios Paraskevadakis** and LOOM PGR **Gbako Shekwoyemi** delivered an invited presentation at the Port of London on 26th September. The presentation was titled "Current research in the field

of Inland Waterways Transport and Logistics”, and formed part of the EU project [ST4W](#) UK study day.

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FET Research, Scholarship & Knowledge Transfer
Committee
(Contact: L.Bellinger@ljmu.ac.uk)

Faculty of Engineering and Technology

September 2019

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

BEST

£25k allocated to LJMU, Corrosion Biokiln, **Dr. Ana Armada Bras**. Institution of Civil Engineers Research and Development Enabling Fund, 2019-2020.

LOOM & MEMARC

£90k allocated to LJMU, Correlating manufacturing strategies to material performance in Laser Powder Bed Fusion of Titanium 6Al-4V, **Dr. Sam Tammas-Williams**. US Air Force Office of Scientific Research, 2019-2022.

£120k allocated to LJMU, development of an innovative flexible manufacturing product life cycle management (PLM) system, **Dr. Rob Darlington, Dr. Thar Baker** (PROTECT), and **Dr. Mark Taylor** (PROTECT). Innovate UK KTP with AMF Precision Engineering, 2019-2021.

GERI

€170k allocated to LJMU, ReACTIVE Too: Reliable Electronics for Tomorrow's Active Systems, **Prof. Dave Harvey**. H2020 Marie Skłodowska-Curie Actions Research and Innovation Staff Exchange (RISE), 2019-2023.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(EEE) **Prof. E. Levi** has been appointed as a Guest Professor at the Harbin Institute of Technology (HIT), Harbin, China. Prof. Levi delivered an Invited Keynote, titled "Electric vehicle charging technologies" at the IEEE Int. Conf. on Smart Technologies EUROCON, held in Novi Sad, Serbia, in July 2019. He also delivered an Invited Keynote, "Charging options for electric vehicles," at the Int. Conf. on Electric Machines and Systems ICEMS, held in Harbin, China, in August 2019.

Prof. Jian Zhang has been appointed as an honorable professor at the Xian Jiaotong Liverpool University.

"Understanding lifetime prediction methodology for In_{0.53}Ga_{0.47}As nFETs under Positive Bias Temperature Instability (PBTI) condition" by **Dr. Zhigang Ji, Xiong Zhang**, and **Prof. Jian Zhang** was selected as the best paper by IEEE 26th International Symposium on the physical and failure analysis of integrated circuits 2019.

RESEARCH IMPACT GENERATING ACTIVITIES

(EEE) **Dr. Obrad Dordevic** has established collaboration with LION Smart GmbH, Munich, Germany, through consultancy work on the project: "Demonstration of BIPED for aerospace applications". The project value is £13k, duration 6 months.

Prof. Jian Zhang, Dr. Rui Gao, Dr. Zhigang Ji, and **Prof. Weidong Zhang** have delivered an invited tutorial at the IEEE 26th International Symposium on the physical and failure analysis of integrated circuits July 2019.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

The Doctoral Academy are currently building a bespoke research student progression system, eDoc. From

October 2019, most of the paper-based forms (RD9R through to RD45), will be replaced by an online approval

process. It will mean that postgraduate research records will be easily accessible by all those involved with the project, saving time and reducing the risk of uncoordinated records in different systems. eDoc will also enable researchers and their supervisors to create

their training portfolios, to set up and record supervisory meetings and to review goals and timelines.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(BEST) **Dr Tina Marolt Cebasek** is a Lecturer at Department of Civil Engineering. She worked as Research Fellow at University of Leeds and as Research Associate at Heriot-Watt University, Edinburgh where she worked on full scale laboratory testing of ballasted and concrete slab track for high speed trains, and numerical modelling of geosynthetic and preforms systems for railway track geo-structures. Dr. Marolt was interviewed on BBC Scotland about this research. She received her PhD degree in Materials Science and Engineering in the field of Mining Engineering and Geotechnology at the University of Ljubljana, Slovenia. Her thesis focused on development of yielding elements for the optimisation of transformed primary stress state in tunnel excavation process. During her PhD, she was a Visiting Researcher at the Geotechnical Institute at TU Bergakademie Freiberg, Germany. She was an Assistant Teacher at University of Ljubljana, Faculty of Natural Sciences and Engineering, Slovenia.

(BEST) **Dr. Volkan Ezcan** has joined the Department of Built Environment as a Lecturer. A graduate of Yıldız Technical University, he worked as a Civil Engineer until moving his focus to Construction Management and completed his MSc (2006) and PhD (2015) at Istanbul Technical University. He has been working in Construction Management for more than 14 years, maintaining close collaboration with industry. He has a particular interest in new business models in construction, the impact of new technology on people and process domains, and off-site construction. In addition to his research and teaching activities in Construction Management, Volkan is also interested in Sports Management, in which he has an MSc (2005 - Marmara University) degree.

(PROTECT) **Dr. Syed Naqvi** has joined the Department of Computer Science as a Programme Leader. Previously he was a Senior Lecturer in Cyber Security, Faculty Research Degree Coordinator for Computing and Course Leader for MSc Cyber Security, at Birmingham City University (BCU). He led BCU's participation in the European H2020 Project [RED-Alert](#). Dr. Naqvi has a practitioner background and previously worked in Forensic Technology Solutions at PricewaterhouseCoopers Enterprise Advisory. His consultancy assignments included antitrust investigations and litigation support services for corporate disputes. He has previously worked as a R&D Project Manager at

[CETIC](#) where he led the capacity-building programme of Cyber Incident Response. He is the founding member of NESSI (Network European Software and Services Initiative) and was Vice President and Board Member of ISSA-BE (Information Systems Security Association – Brussels European Chapter). Syed is currently a Subject Matter Expert (Cyber Security Technologist) at British Computer Society (BCS) and Digital Forensics Assessor of Chartered Society of Forensic Sciences. He has a PhD in Distributed Systems Security from ParisTech. He was a Research Fellow at the STFC Rutherford Appleton Laboratory and held a Visiting Scientist position at Paul G. Allen Center for Computer Science and Engineering of the University of Washington at Seattle.

Dr. Alessandro Raschella joined the Department of Computer Science as a Lecturer in Networking in August 2019. He received the B.Sc. and M.Sc. degrees in Telecommunications Engineering from the University Mediterranea of Reggio Calabria (UNIRC), Italy, and a Ph.D. in Wireless Communications from the Universitat Politècnica de Catalunya (UPC), Spain in 2015. From 2007 to 2009, he was a Research Assistant with UNIRC. He joined the Department of Computer Science of LJMU in 2015, as a Research Fellow. His research interests include wireless networks optimization, dynamic spectrum access in cognitive radio networks, Software-Defined Networking and heterogeneous networks. He has been co-investigator of the Wi-5 research project funded by the Horizon 2020, and has been involved in the SALICE project funded by the Italian Ministry of University and Research (MIUR), the OneFIT project funded by EU FP7, and the 5G project led by Sensor City. He is a Founding Member of the Special Interest Group (SIG) on Social Behaviour Driven Cognitive Radio Networks.

Dr. Yann Savoye is a Lecturer in Computer Science (Computer Games Development) in the Department of Computer Science. From 2017 to 2019 he was a Lecturer in Computer Science in the School of Computing Science and Digital Media (CSDM) at the Robert Gordon University in Aberdeen, Scotland from 2017 to 2019. He is a fellow of the Higher Education Academy in United Kingdom. He received his BSc and MSc in Computer Science from University Claude Bernard in Lyon, France, and his PhD degree from the University of Bordeaux (France). Following this, he did a joint post-doc at Ben Gurion University of the Negev (Israel) and Shandong

University (China); and held a post-doc researcher position at the University of Innsbruck (Austria). His research interests lie in the field of Computer Graphics, Computer Vision, Deep Learning and Digital Fabrication.

In particular, his research work is dedicated to developing new techniques for 3D animation, geometric modeling and optimization, as well as geometric deep learning.

REF UPDATE

REF2021 – declaration of personal circumstances

The University recognises that individual circumstances may significantly compromise a member of staff's ability to work productively over the REF assessment period. Staff are now invited to voluntarily participate in a confidential declaration process that could result in a unit of assessment (UOA) submitting fewer research outputs

to REF2021 than required (typically a UOA will return X number of outputs which is 2.5 times the staff FTE in the unit). Staff should not feel under obligation to declare circumstances relating to health, caring responsibilities, and/ or periods of maternity for example, but may do so if they wish. For further information, see the [LJMU news](#) piece. The next deadline for receipt of declarations is 31st October 2019.

EXTERNAL COLLABORATION

(ARI) **Dr. Rob Crain** welcomed Dr. Matthieu Schaller of Leiden Observatory, Netherlands, for a collaborative visit in August 2019.

Two ARI PGRs have been involved in new collaborations this summer. **Hannah Dagleish** co-organised and lectured at the [Palestinian Advanced Physics School 2019](#), at Birzeit University, Palestine, 14th – 18th July 2019. The aim of the school is to bring renowned researchers to Palestine, providing advanced undergraduate and master level students with an overview of exciting recent developments in modern physics. **Egidijus Kukstas** joined the [GOGREEN](#) (The Gemini Observations of Galaxies in Rich Early Environments) collaborative project aiming to obtain spectroscopy for 21 galaxy groups and clusters at redshifts between 1.0 and 1.5 using the Gemini North and South telescopes, located in Hawaii and Chile. These groups/clusters are thought to be the progenitors of some of the most massive systems today and observing them will extend understanding of galaxy evolution in such dense environments. As part of the collaboration Egidijus is responsible for providing simulated comparisons (using the BAHAMAS simulation) which will help in interpreting the observations.

(BEST) **Dr. Monower Sadique** recently visited his GCRF partner, Chittagong University of Engineering and Technology, Bangladesh, to finalise their project.

They presented their research at a seminar for final year and post-graduate students.

(GERI) In August 2019 **Prof. Xun Chen** hosted six visitors from the University of Shanghai for Science and Technology, China: Dr Jiang Chen; Dr. Rui Gao; Zhenyu Jiang; Zishu Huang; Dr Yujia Hu and Xi Sun.

(LOOM) **Prof. Zaili Yang** welcomed two visitors from China in July: Dr Chengpeng Wan of Wuhan University of Technology, and Dr Yuhong Wang of Ningbo University.

Dr. Chia-Hsun Chang hosted Dr. Kezhong Liu of Wuhan University of Technology, China, for a two week visit.

(PROTECT) **Dr. Thar Baker** hosted Prof. Rajkumar Buyya of the University of Melbourne, Australia, for a collaborative visit in July 2019.

Dr. Gyu Myoung Lee was invited to the fourth ITU workshop on data processing and management for Internet of Things and Smart Cities & Communities, organized by International Telecommunication Union (ITU), 19 July 2019, Geneva, Switzerland. As Workshop Convener and Chair of ITU-T Focus Group on Data Processing and Management (FG-DPM), Dr. Lee gave an opening speech, and delivered a talk on the way forward of FG-DPM.

NOTABLE PUBLICATIONS

(ARI) **Donohoe-Keys, C.E., Martig, M., James, P.A.,** and Kraljic, K. (2019) “Redistribution of Stars and Gas in the Star Formation Deserts of Barred Galaxies”, *Prints arXiv*, 1908.11119, [DOI](#).

(EEE) **Subotic, I., Dordevic, O., Gomm, J.B., and Levi, E.** (2019) “Active and reactive power sharing between three-phase winding sets of a multiphase induction machine”, *IEEE Trans. on Energy Conversion*, 34, 3, 1401-1410, [DOI](#).

(PROTECT) **Al-khafajiy, M., Baker, T., Al-libawy, H., Maamar, Z., Aloqaily, M., and Jararweh, Y.** (2019) “Improving Fog Computing Performance via fog-2-fog Collaboration”, *Future Generation Computer Systems*, 100, 266-280, [DOI](#). This is one of the key outcomes of an ongoing R&D collaboration project with Gnowit Inc. (Canada), Jordan University for Science and Technology (Jordan), Zayed University (UAE), and University of Babylon (Iraq).

OTHER ITEMS

GaP (Grants and Projects) is LJMU’s new software for anyone applying for external funding to work together with professional services on bids and project proposals. The new GaP system is now live, so once trained, Principal Investigators will be able to add their projects to GaP and create their own costings.

(BEST) £5k allocated to LJMU, Development of a novel Electro-Coagulation digital twin for water treatment in Sri Lanka, **Dr. Iacopo Carnacina**. British Council SE Asia Small Scale Research Project Scheme, Oct. 2019 – Sep. 2020.

(EEE) **Dr. Obrad Dordevic** has been appointed as an Associate Editor of the IET Power Electronics journal.

Prof. E. Levi has delivered a lecture at Beijing Jiaotong University in August 2019, under the auspices of the Intelligent Industrial Electronics - IEEE SYP seminar, titled “Electric vehicles: Current state of affairs and charging options”.

(LOOM) **Dr. Marco Messina** is a visiting scholar at TUWIEN in Vienna as part of the REF-UPskilling program from 8th of September till 21st. It is a two weeks program on an advanced technique able to strain

extensively silicon nanowires by a cutting edge piezoelectric straining device made of PMN-PT (*i.e.* state of art piezoelectric material).

(LOOM & EEE) **Dr. Karl Jones** was successful in getting REF upskilling funding - **Prof. Wei Zhang** is mentor, and he as well as Dr. Helen Burrell from forensics are the mentees.

(PROTECT) **Dr. Thar Baker** and **Prof. Dhiya Al-Jumeily** are organizing as Guest Editors, with a team from Zayed University in UAE, and RMIT University in Australia, a Special Issue on “Semantic eSystems: Engineering Methods, Techniques, and Tools” in Journal of Software: Practice and Experience (SPE), Wiley. The [call](#) is open for submission. **Dr. Thar Baker** is also organizing, as Managing Guest Editor, with a team from Beijing Institute of Technology in China, Luleå University of Technology in Sweden, Beijing University of Posts and Telecommunications in China, and McGill University in Canada, a Special Issue on “Enabling Technologies for Energy Cloud” in Journal of Parallel and Distributed Computing (JPDC), Elsevier. The [call](#) is open for submission.

Faculty of Engineering and Technology

July 2019

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EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£677k allocated to LJMU, Novel extensions to state-of-the-art simulations of galaxy formation, **Dr. Rob Crain**. Royal Society University Research Fellowship Extension, 2019-2022.

£112k allocated to LJMU, Large Synoptic Survey Telescope: Phase B, **Prof. Chris Collins**. Part of the £7.7m STFC UK involvement in the LSST, 2019-2021.

LOOM

\$12k allocated to LJMU, Cybersecurity in the maritime industry, **Dr. Chia-Hsun Chang**. International Association of Maritime Universities Academic Staff in FY2019, 2019-2020.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(PROTECT) **Dr. Hoshang Kolivand** delivered a keynote speech at International Conference on Digital Image & Signal Processing (Oxford, UK, 29-30 April 2019) entitled “Augmented and Virtual Reality: A Vision of 25 Years”. Dr. Kolivand also delivered a keynote speech at the Asia International Conference on Multidisciplinary Research 2019 (AIMR’19) on 10–11 May 2019, Colombo, Sri Lanka, entitled “Current and Future Immersive Technologies considering Virtual and Augmented Reality”.

(LOOM) **Dr. Chia-Hsun Chang** delivered a keynote address on “Autonomous Shipping and its Challenges” at Taiwan Scholar Workshop in Manchester University, 15 June 2019.

Prof. Jin Wang delivered three keynote/plenary speeches on “An evidential reasoning approach for safety and reliability management of large engineering systems under uncertainties”; “Risk-based Verification (RBV) of Large Engineering Systems such as Offshore Oil and Gas Installations”; and “Automation can make marine engineering systems safer” (with **Dr. S. Loughney**). These were delivered at the Third International Symposium on Stochastic Models in Reliability Engineering, Life Sciences and Operations Management (SMRLO’19), 28-31 May 2019, Beijing, China; the Annual Conference of the Institute for Quality and Reliability (IQR), 8-9 June 2019, Shenzhen, China; and 2019 World Transport Convention (WTC2019), 13-16 June 2019, National Convention Center, Beijing.

RESEARCH IMPACT GENERATING ACTIVITIES

[Clean Growth UK](#) is excited to announce the success of a Catapult bid for the provision of specialist support, for 2 to 4 years, in the following categories:

- Advisory and consultative engineering services
- Research and development services and related consultancy services

- Business services: law, marketing, consulting, recruitment, printing and security

This is a unique opportunity for LJMU and partners to expand our support platform for organisations throughout the UK and have a direct impact on the UK’s innovation system, making a major long-term contribution to UK economic growth.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

A large proportion of **ARI PGR students** have been presenting their research at [EWASS 2019](#) (European Week of Astronomy and Space Science) in Lyon, France, 24-28 June 2019. A significant number also participated at [NAM 2019](#) (National Astronomy Meeting), University of Lancaster, 30 June – 4 July 2019.

Faculty Research Week took place 14 – 16 May 2019. The event featured visiting keynote speakers and over 100 FET PGRs presented their research through posters, pitches and presentations. The following PGRs received prizes:

Best Potential Impact – Poster

- 1st **Hiba Alsmadi**, PROTECT (DOS: **Prof. Dhiya Al-Jumeily**)
- 2nd **Cameron Kelly**, LOOM (DOS: **Dr. Eddie Blanco-Davis**)
- 3rd **Patrick Riley**, APM (DOS: **Dr. Sandra Ortega Martorell**)

Best Poster

- 1st **Cameron Kelly**, LOOM (DOS: **Dr. Eddie Blanco-Davis**)
- 2nd **Sin Ying Tan**, PROTECT (DOS: **Prof. Dhiya Al-Jumeily**)
- 3rd **Patrick Riley**, APM (DOS: **Dr. Sandra Ortega Martorell**)

Best Paper

- 1st **Ahmed Makki**, LOOM (DOS: **Dr. Thanh Nguyen**)
- 2nd **Kang Ji**, EEE (DOS: **Dr. Qian Zhang**)
- =3rd **Mohsin Amin**, BEST (DOS: **Dr. Badr Abdullah**)
- =3rd **Marko Slunjski**, EEE (DOS: **Dr. Martin Jones**)

Best Elevator Pitch

- 1st **Mehzabeen Mehedi**, EEE (DOS: **Prof. Jian Zhang**)
- 2nd **Bareq Abdulhadi**, BEST (DOS: **Dr. Patryk Kot**)
- 3rd **Natasa Orphanidou**, PROTECT (DOS: **Prof. Abir Hussain**)

Best Oral Presentation

- 1st **Sebastian Turner**, ARI (DOS: **Prof. Steve Longmore**)
- 2nd **Mohsin Amin**, BEST (DOS: **Dr. Badr Abdullah**)
- =3rd **Neil Pickavance**, BEST (DOS: **Prof. Andy Ross**)
- =3rd **Elizabeth Parrott**, GERI (DOS: **Dr. Fred Bezombes**)

Dean's Prize for Best PhD Thesis 2018:

- Dr. Danial Yazdani**, LOOM (DOS: **Dr. Thanh Nguyen**)
- Dr. Jun Qi**, PROTECT (DOS: **Dr. Po Yang**)
- Dr. Ted Mackereth**, ARI (DOS: **Dr. Ricardo Schiavon**)
- Dr. Nguyen Truong**, PROTECT (DOS: **Dr. Gyu Myoung Lee**)
- Dr. Upul Jayasinghe**, PROTECT (DOS: **Dr. Gyu Myoung Lee**)
- Dr. Mikel Zabaleta**, EEE (DOS: **Prof. Emil Levi**)

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

Dr. Juan Ahuir-Torres has recently joined GERI as the Research Assistant supporting the Innovate UK open call

project with Sandon Global Engraving Technology Ltd, 2019-2021.

REF UPDATE

REF2021 – declaration of personal circumstances

The University recognises that individual circumstances may significantly compromise a member of staff's ability to work productively over the REF assessment period. Staff are now invited to voluntarily participate in a confidential declaration process that could result in a unit of assessment (UOA) submitting fewer research outputs

to REF2021 than required (typically a UOA will return X number of outputs which is 2.5 times the staff FTE in the unit). Staff should not feel under obligation to declare circumstances relating to health, caring responsibilities, and/ or periods of maternity for example, but may do so if they wish. For further information, see the [LJMU news piece](#).

Research-only staff – are you an independent researcher?

Staff on research-only contracts (typically staff in Research Assistant, Research Fellow, Research Officer roles) are being contacted during July to establish their eligibility for submission to REF2021. To be eligible, research-only staff must primarily be undertaking research on a self-directed basis (as an independent researcher), as opposed to carrying out research on behalf of someone else. This is in line with the University's code of practice for REF2021 (Part 3). Relevant staff will initially be asked to complete a short survey and members of the University's REF Team will advise on individual outcomes or next steps. Should you have any immediate queries, please contact REF2021@ljmu.ac.uk.

A number of FET researchers have been awarded funding via the **LJMU REF-upskilling mentoring scheme**. FET have been allocated £17,500.00 for 2019-20 academic year, to the following mentee/mentor partnerships:

Dr. Onur Dursun (mentee)/**Dr. Vida Maliene** (mentor), Parametric approaches in quantity take off

Dr. Yaser Jemaa/Dr. William Atherton, Bond performance of the deep embedment technique for

improving the resilience of existing reinforced concrete infrastructure.

Dr. Aine MacDermott/Prof. Qi Shi and **Dr. Gyu Myoung Lee**, Privacy preserving issues in the dynamic internet of things.

Dr. Mohamed Kara-Mohamed/Dr. Qian Zhang, Unmanned Aerial Vehicles (UAVs) for extreme and challenging environments.

Dr. Xiaoxiao Liu/Prof. Mike Morgan, Development of a multi-energy surface finishing system.

Dr. Musa Bashir/Prof. Zaili Yang, Design of a novel concept of hybrid powered vessel for sustainable coastal operations.

Dr. Chia-Hsun Chang/Prof. Zaili Yang, Risk evaluation of maritime autonomous surface ships in the UK.

Dr. Marco Messina/Prof. Ian Jenkinson, Manufacturing of the first accelerometer with integrated bottom up Silicon Nanowires Piezo-resistors.

Dr. Ava Shahrokhi/Dr. Mehdi Seddighi, Floating offshore wind turbines wake structure simulation.

EXTERNAL COLLABORATION

Applied Computing Research Group arranged a keynote to be delivered by Prof Rajkumar Buyya to FET staff and researchers on 10 July 2019 on the subject "*New Frontiers in Cloud and Edge/Fog Computing for Big Data and Internet-of-Things Applications*". Prof Buyya (University of Melbourne, Australia) is a world-leading professor in Distributed Systems and Cloud Computing. He is named in the recent Clarivate Analytics' (formerly Thomson Reuters) Highly Cited Researchers and "World's Most Influential Scientific Minds" for three consecutive years since 2016. Prof Buyya is recognized as Scopus Researcher of the Year 2017 with Excellence in Innovative Research Award by Elsevier.

(APM) **Prof. Paulo Lisboa**, **Dr. Sandra Ortega-Martorell** and **Dr. Ivan Olier Caparroso** attended the

launch of the MSc in Big Data Science and Analytics at the University of Bahrain on 1 April 2019. The MSc is jointly delivered by the University of Bahrain and LJMU. The programme, delivered in Bahrain from September, will equip participants with state-of-the-art computer science skills to process huge amounts of data, as well as teaching them modern statistical analysis methods and how to create new data services. Positioning itself as a technology hub, Bahrain has a vibrant start up FinTech scene.

(ARI) In May and June 2019, ARI welcomed two visiting research students from the USA. **Prof. Nate Bastian** hosted Seth Gossage of Harvard University; and **Dr. Dan Perley** welcomed Prapad Gatkin of the University of Maryland.

(BEST) **Dr. Monower Sadique** hosted Prof G M Sadiqul Islam of Chittagong University of Engineering & Technology, Bangladesh, for a 2 week collaborative visit.

(GERI) **Prof. Mike Morgan** completed an ERASMUS Exchange visit to the University of West Bohemia, Czech Republic, 18–20 June. A reciprocal visit is planned for October 2019.

(LOOM) **Dr. Eddie Blanco-Davis** welcomed Dr. Trakarn Prapasongsa of Mahidol University, Thailand, for a 3 month research visit.

(PROTECT) **Prof. Dhiya Al-Jumeily** welcomed Dr Ahmed Japeri of UiTM, Malaysia, for a 12 month research collaboration. **Dr. Áine Mac Dermott** welcomed Stephen Lea for a 12 month research visit.

NOTABLE PUBLICATIONS

(ARI) Kruijssen, J. M. D., Schrubba, A., Chevance, M., **Longmore, S. N.**, et al. (2019) "Fast and inefficient star formation due to short-lived molecular clouds and rapid feedback", *Nature*, 569, 519, [DOI](#).

(LOOM) **Wan, C.**, Yan, X., Zhang, D., **Qu, Z.**, **Yang, Z.** (2019) "An advanced fuzzy Bayesian-based FMEA approach for assessing maritime supply chain risks", *Transportation Research Part E: Logistics and Transportation Review*, 125. pp. 222-240, [DOI](#).

(PROTECT) Al Ridhawi, I., Aloqaily, M., Kotb, Y., Jararweh, Y., **Baker, T.** (2019), "A Profitable and Energy-Efficient Cooperative Fog Solution for IoT Services", *IEEE Transactions on Industrial Informatics*, Early Access 17 June 2019, [DOI](#). This is one of the key outcomes of an ongoing R&D collaboration project with University of Ottawa (Canada), Gnowit Inc. (Canada), University of Western Ontario (Canada), Jordan University for Science and Technology (Jordan).

OTHER ITEMS

(ARI) **Josh Veitch-Michaelis**, PDRA at ARI, has been accepted onto a programme called the Frontier Development Lab ([FDL](#)). In collaboration with ESA, Josh is spending an intensive 8 weeks at the European Space Research Institute (Italy) and the University of Oxford. He is working to tackle Disaster Prevention (i.e. flooding) using state-of-the-art machine learning and Earth observation data.

One of ARI's 3rd Year MPhys students, **Adam McDonald**, has been accepted on to a prestigious [summer scheme](#) at GSI in Darmstadt, which operates a unique large-scale accelerator for heavy ions.

(PROTECT) **Prof. Abdennour El Rhalibi** has been appointed Expert Advisor for the EU Education,

Audiovisual and Culture Executive Agency, for their Creative Europe – MEDIA Programme in May 2019, in the framework of the Call for Proposals EACEA/24/2018 "Support for the Development of European Video Games 2019".

On 20 May, the International System of Units (SI) underwent its biggest overhaul since its establishment in 1875. Four of the seven base units - the kilogram, the ampere, the kelvin and the mole - will now be defined against universal constants. The redefinition is an important milestone in the development of the Industrial Strategy. The National Physical Laboratory (NPL) is the UK's National Measurement Institute. More information available [here](#).

Faculty of Engineering and Technology

May 2019

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£483k allocated to LJMU, Dissecting galaxies at the cosmic dawn, **Dr. Renske Smit**. STFC Ernest Rutherford Fellowship, 2019-2024.

BEST

£20k allocated to LJMU, FILMCRETE - a Self-healing Concrete to increase structures' durability, **Dr. Ana Bras**. Royal Society, Mar 2019-Mar. 2020.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(BEST) Dr. Monower Sadique delivered a key note address at the International Conference on Civil and Environmental Engineering Technologies ([ICCEET](#)

[2019](#)), 23rd -24th April 2019 at University of Kufa, Al Najaf, Iraq.

RESEARCH IMPACT GENERATING ACTIVITIES

(ARI) A £207k enterprise contract has been won by **Prof. Iain Steele**, **Dr. Andrzej Piascik** and **Dr. Helen Jermak** from the South African Astronomical Observatory to build a high efficiency spectrograph for their new 1m robotic telescope. An additional £15k enterprise contract has been awarded to **Prof. Steele** and **Dr. Piascik** by QinetiQ to study the accuracy of alternative celestial navigation systems.

(BEST) In partnership with Building Research Establishment (BRE), BEST researchers have engaged with the Government of India to support the 'Housing

for All' mission which aims to ensure the provision of a home for every family in India. In March 2019, **Prof. Rafid Al-Khaddar**, **Prof. Mike Riley**, and **Dr. Patryk Kot**, with BRE, attended a Global Housing Technology Challenge Expo in New Delhi. Prof. Riley delivered a masterclass to housing technology start-ups and was a panel member for the plenary session. The event attracted around 5000 attendees from industry, research, and government, and event was live-streamed on Indian TV. LJMU and BRE have now been engaged to advise on the next stage of the Challenge.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

(ARI) PhD student **Alex Hill** was awarded a grant from the Doctoral Academy's PGR Conference Travel Fund to attend the SKA General Science Meeting and Key Science Workshop 2019. Taking place at Jodrell Bank

Observatory in April 2019, the meeting focused on the big-science endeavours taking place in the 2020s. The Square Kilometre Array (SKA) will observe the universe in its adolescence, allowing astronomers to study its

growth and evolution, as well as test models of dark matter and probe the mysterious nature of dark energy. Alex presented a poster on his research into the morphology and intrinsic alignments of radio galaxies using the EAGLE simulation. At the conference, he engaged with the radio observer community, and disseminated research being undertaken at ARI. Alex also won a prize for best poster within the School of Physical

Sciences at the University of Liverpool's Faculty of Science and Engineering poster day.

PhD student **Hannah Dalgleish** was invited to take part in a [Voice of the Future](#) event at Parliament. The event allows young scientists to directly ask Parliamentarians questions related to the future of UK science

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(BEST) **Dr. Ariel Edesess** has recently joined the Low Carbon Eco-Innovatory team. She received her MSc at the University of Limerick where her research focused on teaching physics interactively to improve gymnastics coaches' understanding of biomechanics. She completed her PhD at University College Cork, Ireland, where her research focused on increasing the reliability and safety of accessing offshore wind turbines using CFD (OpenFOAM) and through developing analytical wave models of ocean waves interacting with fixed offshore wind turbines. Currently, she is most interested in applying her research to other renewable energy technologies, specifically focusing on location-dependent energy generation methods and reducing the costs to increase the availability of low carbon electricity worldwide.

(CS) **Dr. Yun Sheng** recently joined the Department of Computer Science as Senior Lecturer. He received his PhD. from the University of Surrey and then worked as research fellow at the University of Surrey, University of Bath, and Nanyang Technological University Singapore, before taking an associate professorship at East China Normal University (ECNU), Shanghai, China. He is experienced as both a participant and principle investigator, from European Union FP6 Network of Excellence, EPSRC, Singapore government, Chinese National Foundation of Nature and Science, National Basic Research Program of China (973 Program), and

computer vision industries, etc. His current research interests cover a wide spectrum of hotspots in Multimedia, Computer Graphics and Vision, including 3D modelling, reconstruction and animation, geometric mesh processing and shape analysis, non-photorealistic rendering.

Dr. Thomas Hughes-Roberts is a Senior Lecturer in Human Computer Interaction and Usability. Following a PhD studying Persuasive Design and Privacy at the University of Salford, he joined the academic team at Nottingham Trent University (NTU) where he was a lecturer for six years. During his time at NTU, Tom was part of the Interactive Systems Research Group (ISRG) and worked on EU-funded research projects studying the use of technology in assistive learning. His current research interests include the application of Virtual/Augmented Reality and the behavioural evaluation of VR experiences

Dr. Mohamed Mahyoub has recently joined the Department of Computer Science as an industry research associate (Data Scientist at LivingLens). He obtained both his BSc in computer science and PhD in Machine Learning from LJMU. Before joining LJMU as a member of staff, he worked as a Full-stack Developer and DBA at MedeTrax managing hospital databases and electronic observation systems. His research interests are in the areas of Machine Learning, Text Mining, Insight Analysis, and onset prediction of dementia.

EXTERNAL COLLABORATION

(APM) **Prof. Paulo Lisboa** attended the launch of the MSc in Big Data Science and Analytics at the University of Bahrain on 1st April 2019. The MSc is jointly delivered by the University of Bahrain and LJMU. The programme, delivered in Bahrain from September, will equip participants with state-of-the-art computer science skills to process huge amounts of data, as well as teaching them modern statistical analysis methods and how to create new data services. Positioning itself as a technology hub, Bahrain has a vibrant start up FinTech scene.

(BEST/APM) **Dr. Patryk Kot, Prof. Andy Shaw and Prof. Paulo Lisboa** visited Warsaw University of Technology to discuss potential institutional collaborations and collaborative research in the areas of non-destructive sensors for structural health monitoring; sensors for water quality monitoring; novel techniques for 3D reconstruction, and artificial Intelligence algorithms for metadata analysis. In addition, the team were invited to visit the Museum of King Jan III's Palace at Wilanów where potential research collaborations were explored. There will be an opportunity to validate sensor research in real case scenarios at the palace premises that will include water and air quality monitoring, structural health monitoring and artificial intelligence algorithms for metadata analysis.

(BEST) **Dr. Ana Bras** visited University of Novi Sad, Serbia in March 2019 to participate in a meeting and workshop of EU COST Action 15202: Self-healing As preventive Repair of CONcrete Structures. Dr. Bras chaired a session for PhD students and ECRs on bio-based and polymer-based self-healing concrete and mortars.

The **Low Carbon Eco-Innovatory** team have welcomed Lisa Laurent, a student at La Prépa des INP Toulouse, for a 2 month placement visit.

Mr. Larry Wilkinson, Dr. Michaela Gkantou and Dr. Patryk Kot visited International College of Business and Technology, Sri Lanka as a part of LJMU-ICBT Programme to assess a final year research project

presentations. The visit focused on quality assurance and the possibility of joint publications based on the research outcomes from the dissertations. Dr. Kot delivered an invited, interactive CPD Workshop “Research Methodology” to 250 students, researchers and lecturers. During the visit to Sri Lanka, Dr. Gkantou and Dr. Kot were also invited to the University of Moratuwa in order to establish a research collaboration on areas including sensor applications in structures.

(Computer Science) Dr. Catherine McMahon of Walton Centre NHS Foundation Trust has commenced a three year collaboration with **Prof. Dhiya Al-Jumeily**.

Dr. Gyu Myoung Lee welcomed Dr. Dan Wang of Chongqing University of Posts and Telecommunications, China, for a 12 month research visit.

Dr. Áine MacDermott is leading a collaborative project between the Department of Computer Science at Liverpool John Moores University, and Dr Farkhund Iqbal from the College of Technological Innovation at Zayed University in Dubai. A research assistant will begin working on their project in June 2019, exploring “Applied Forensic Linguistics in the Internet of Things for Cyber Security and Digital Forensics”.

(GERI) **Prof. Xun Chen** has welcomed two visitors for 12 month post-doctoral study: Dr. Linlin Wan of Hunan University of Science and Technology, China, and Dr. Guangsheng Chen of University of Shanghai for Science and Technology, China.

(LOOM) Dr. Dong Yang of the Shipping research centre, Hong Kong Polytechnic University visited LOOM for 1 week, hosted by **Prof. Zaili Yang**. **Dr. Christos Kontovas** hosted Prof. Charilaos Psaraftis of the Technical University of Denmark for a short visit, during which Prof. Psaraftis delivered a FET research seminar “Decarbonization of maritime transport: to be or not to be?”.

NOTABLE PUBLICATIONS

(ARI) **Davies, J. J., Crain, R., McCarthy, I. G., Oppenheimer, B.D., Schaye, J., Schaller, M., and McAlpine, S.** (2019) “The gas fractions of dark matter haloes hosting simulated $\sim L^*$ galaxies are governed by the feedback history of their black holes”, *Monthly Notices of the Royal Astronomical Society*, Vol. 485, pp. 3783-3793, [DOI](#).

(BEST) **Romano, A., Bras, A., Grammatikos, S., Shaw, A., and Riley, M.** (2019) “Dynamic behaviour of bio-

based and recycled materials for indoor environmental comfort”, *Construction and Building Materials*, Vol. 211, pp. 730-743, [DOI](#).

(EEE) **Zoric, I., Jones M., and Levi E.** (2018), “Arbitrary Power Sharing Among Three-Phase Winding Sets of Multiphase Machines,” *IEEE Transactions on Industrial Electronics*, Vol. 65, Issue: 2, pp. 1128 – 1139, [DOI](#).

OTHER ITEMS

LJMU PhD scholarships have been awarded to applicants working with FET researchers. **Prof. Paolo Mazzali, Dr. Claire Burke** (both ARI) and **Dr. Atif Waraich** (CS) will be Directors of Studies, respectively. The PGRs will enrol in September 2019.

(APM) **Dr. Steve Webb** has been awarded £5k of Pump Priming funding from [Liverpool Centre for Mathematics in Healthcare](#) for a project entitled “Modelling the microenvironment in human liver spheres from pluripotent stem cells”.

(ARI) The [2019 Merseyside Astronomy Day](#) took place on the 13th of April at the World Museum Liverpool to a sell-out audience of distance learning students, amateur astronomers and the general public. Featuring speakers from several universities including LJMU, the talks highlighted current research in astrophysics.

ARI researchers have had successful applications for Hubble Space Telescope time. Each application has funding attached, which will be distributed to partners in the USA, to assist with processing the data gathered from the telescope. **Prof. Nate Bastian** is PI of a project with \$200k of attached funding to support postdoctoral researchers to help with the project. **Dr. Matt Darnley** is PI of a project with \$50k of attached funding.

Prof. Ivan Baldry is mentioned in an [article](#) published in *Nature*. The article is an interview with Scottish artist Katie Paterson and features of discussion of a piece of her work, ‘The Cosmic Spectrum’ (2019), a rotating colour wheel, with segments showing the “average colours” of the Universe from the Big Bang to now to the far future. Prof Baldry calculated colours for this exhibit from cosmological models and spectral observations of galaxy populations.

The new £15k 14 inch Celestron Telescope has arrived and been tested at ARI. The telescope will be shipped to Tenerife in the summer.

(BEST) **Dr. Ana Bras** has been awarded the Fellow (FICE) grade of membership of the Institution of Civil Engineers (ICE). Fellow is the highest grade of membership of the ICE and Dr. Bras is the youngest woman ever to receive this from the North West region.

(Computer Science) **Dr. Gyu Myoung Lee** was invited to the Global Standards Collaboration (GSC-22) meeting hosted by IEC/ISO on 26-27 March 2019 in Switzerland as the Chair of ITU-T Focus Group on Data Processing and Management (FG-DPM) and delivered a talk on DPM framework to delegates from 12 standardization organizations (IEEE, ETSI, oneM2M, etc.).

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£422k allocated to LJMU, Developing Automated Detection and Monitoring of Peat Fires in Indonesia with Thermal Infrared Sensors under Drones, **Prof. Steve Longmore** (PI) and Prof. Serge Wich (SCS). STFC Global Challenge Research Fund, April 2019 – March 2021.

LOOM & MEMARC

€225k allocated to LJMU, StrongLink: Predictive Materials Modelling at Atomic Scales and Applications, **Prof. James Ren**, **Prof. Ian Jenkinson** and **Prof. Jin Wang**. EU Marie Skłodowska-Curie Individual Fellowship (Nominated Fellow: Dr. J. Lv), 2019-2021.

€225k allocated to LJMU, STOP-FIRE: Emergency Decision Support System of Offshore Platform Fire, **Prof. Jin Wang**, **Dr. Sean Loughney**, **Prof. Zaili Yang**, **Dr. Trung Thanh Nguyen** and **Dr. Sean Malkeson**. EU Marie Skłodowska-Curie Individual Fellowship (Nominated Fellow: Dr. Y. Wang), 2019-2021.

£264k allocated to LJMU, COINS - Customer-Operational Information System for Railway Stations, **Dr. Trung Thanh Nguyen (PI)**, **Dr. Alison Hardy**, **Dr. Charly Lersteau**, **Mr. Igor Deplano**, **Dr. Qian Zhang**, **Mr. Yannis Ancele** and **Mr. Ahmed Makki**. InnovateUK SBRI: First of A Kind, March – November 2019. 5 grants have been awarded, and LJMU is the only university awarded a First of A Kind grant so far.

RESEARCH IMPACT GENERATING ACTIVITIES

(BEST) **Dr. Patryk Kot** and **Prof. Andy Shaw** were invited to demonstrate the state of the art digital technologies developed as a part of Horizon 2020 Project “DigiArt” funded by the European Union (grant agreement 665066) during “The Digital Single

market- Achievements and Challenges?” [event](#) held at the European Parliament, Brussels, 5th February 2019. The event attracted around 70-100 journalists from the EU member states to hear about research projects.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

(ARI) PhD student **Tom Sedgwick** and a team of ARI astronomers have discovered 140 ‘new’ galaxies, with findings due to be [published](#) in April’s edition of the prestigious journal Monthly Notices of the Royal Astronomical Society. These previously unknown galaxies were found whilst searching for exploding stars, known as supernovae.

ARI PGR **Emma Beasor** (Director of Studies **Dr. Ben Davies**) has been awarded a Hubble Fellowship in the USA for her first post-doc position. It is rare for a PGR to be offered this fellowship straight after the PhD, but this is the 2nd time in 3 years that an ARI student has been awarded this (Ivan Cabrera Ziri Castro, 2016), and LJMU now has more alumni as Hubble fellows than all other UK universities combined.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(BEST) **Dr.-Ing. Onur Dursun** recently joined the Department of Built Environment as Senior Lecturer in Quantity Surveying. Prior to this appointment, he was an Assistant Professor at the Department of Architecture, Yasar University (Izmir, Turkey); a Visiting Lecturer at German University in Cairo (Berlin, Germany); a Researcher at the Institute of Construction Economics, University of Stuttgart (Germany), and a Teaching Assistant at Istanbul Technical University (Turkey). He was awarded a Doctor of Engineering (Dr.-Ing.) degree in the subject of Construction Economics by University of Stuttgart in 2013. He obtained two MSc degrees in Construction Project Management from University of Reading (UK) and Istanbul Technical University (Turkey) in 2008 and 2009, respectively. Dr. Dursun is interested in research areas/topics related to: (1) construction economics – early estimation of key project determinants using statistical modelling and machine learning methods; (2) optimization of building design based on selected performance metrics using simulations coupled with genetic algorithms, and (3) integration of virtual reality in building design education.

(Computer Science) **Dr. Silvester Czanner** has joined the Department of Computer Science as a Subject Head. He holds a Mgr in Mathematics, Computer Graphics and Computer Science for Mathematicians and a PhD in Mathematics (Geometry and Topology), both from Comenius University, Slovakia. Before joining LJMU, he worked as a researcher and academic in Slovakia, Germany, Japan, USA and UK. Dr. Czanner's research is in areas of Computer Graphics, Medical Imaging and Digital Technologies, and their applications in education. As PI or Co-I, he has been awarded research grants from IAS European Frontiers grant, Robert's Fund and Reinvention Centre Collaboration fund, EPSRC and TLE Fund. Currently he is a Co-I on [H2020-MSCA-ITN -2016 ImageInLife](#), Training European Experts in Multilevel Bioimaging, Analysis and Modelling of Vertebrate Development and Disease. Dr. Czanner is a senior member of the Association

for Computing Machinery (ACM) , director and executive committee member of UK Chapter of the EUROGRAPHICS Association.

Dr. Sorren Hanvey has recently joined the Department of Computer Science as a Lecturer in Computer Security and Forensics. Before joining LJMU, he worked as a post-doctoral researcher at Lero – The Irish Software Research Centre, based at the University of Limerick and as a consultant researcher with the SEAD group at the Open University. His research interests are in the areas of Adaptive Digital Forensics and the engineering of Security/Privacy Aware Systems. He looks forward to collaborating with colleagues with similar, or other research interests.

Dr. Wasiq Khan has joined the Department of Computer Science as a Lecturer in Data Science/AI. He is also a Visiting Consultant for an EU-funded research project [iBorderCtrl](#) at Manchester Metropolitan University. Dr. Khan received his B.Sc. from the University of Punjab; M.Sc. from COMSATS University, Pakistan; M.Sc. in Artificial Intelligence for Board Games, and a Ph.D. in Speech Processing and Intelligent Reasoning, both from the University of Bradford. As a Research Associate at the University of Central Lancashire, Dr. Khan worked on the [Flight Guardian](#) research project, a disruptive cockpit technology to improve flight safety by real-time monitoring of the cockpit instruments. He also worked as a Research Fellow at Reading University where he researched Pathological Gait analysis and Bayesian inference modelling in [CORBYS](#): a cognitive control framework for robotic systems. Dr. Khan is research active in the domain of Computational Intelligence (intelligent decision-making, machine/deep learning, expert & knowledge based systems, and fuzzy systems), Video/Image/Speech data processing and Data Science.

(LOOM) **Dr. Sean Malkeson** recently joined the Department of Maritime and Mechanical Engineering as a Lecturer. He completed his undergraduate degree and PhD at the University of Liverpool. His PhD

research involved the analysis of turbulent premixed and stratified combustion using Direct Numerical Simulations (DNS) to develop novel models for high-fidelity simulations. Dr. Malkeson extended his research to examine the effects of mixture stratification on ignition behaviour. Following this, he held a PDRA position at Liverpool, collaborating with the Combustion Research Group at Newcastle University, and subsequently became a lecturer in the School of Engineering at the University of Liverpool. Whilst maintaining a visiting researcher position at Newcastle University, he moved to industry, working as a Consultant Engineer involved in Gas Dispersion Analyses, Fire Detection Studies, Fire Modelling and Conjugate Heat Transfer Problems on onshore and offshore installations. He is Chartered with the Institution of Mechanical Engineers (IMechE).

(MEMARC) **Dr. Ava Shahrokhi** recently joined the Department of Maritime and Mechanical Engineering

as a Lecturer in Mechanical Engineering. Her main research interests include CFD applications in renewable energy; Large Eddy Simulation; Wind Turbine Design; Aerodynamic Optimization, and Atmospheric flows. Dr. Shahrokhi has a PhD in Aerospace-Aerodynamics Engineering from Amirkabir University. She previously worked as a lecturer at Staffordshire University, and as a research fellow at the University of Sheffield working on a Horizon 2020 [project](#) developing and validating innovative solutions for small and medium size wind turbines. Dr. Shahrokhi also previously worked as a research fellow in the Meteorology Department of the University of Reading, working on [GungHo](#), designing accurate software for weather forecasting for the Met Office. Whilst there, she developed a fully compressible Euler equation with implicit treatment of acoustic and gravity waves for neutral, stable and unstable atmospheric boundary layer in OpenFoam environment which is [available](#) for public use.

EXTERNAL COLLABORATION

(APM) On 22nd February 2019 **Dr. Gabriela Czanner** visited the Department of Image Processing at the Institute of Information Theory and Automation (UTIA), Czech Academy of Sciences, Prague, Czech Republic, for collaborative meetings about image preprocessing and image analysis. Dr. Czanner gave a seminar titled “Statistical Spatial Modelling in Ophthalmic Images: Learning about Associations and toward Diagnosis”. For her research into low cost diagnosis of glaucoma (funded via an LJMU Global Challenges Research Fund Small Grant), Dr. Czanner held collaborative meetings with her co-investigators from the Universities of Dundee and Edinburgh, and visited EPIPOLE, a company that develop portable retinal fundus cameras.

(ARI) The ARI has welcomed two visitors from Instituto de Astrofísica de Canarias (IAC), Spain, both hosted by **Prof. Johan Knapen**. Dr Cristina Marinze-Lombilla arrived in January for a 3 month visit, and Felipe Jimenez-Ibarra visited for two weeks during

February. **Dr. Ricardo Schiavon** also welcomed a PGR visitor; Geraldo Goncalves dos Santos Junior of University of Sao Paulo, Brazil, for a short collaboration.

(Computer Science) Dr. Mohammed Al-Jefery of Babylon University, Iraq, commenced a 3 year research collaboration hosted by **Prof. Dhiya Al-Jumeily**.

(LOOM) Dr. Dimitrios Paraskevadakis hosted a workshop for the EU project ST4W “Smart Tracking for Waterways”. The objective of the workshop was to provide participants with the opportunity to explore real challenges within UK and European Inland Waterways and to bring together key stakeholders from the supply chain logistics industry, encouraging inter-sector collaboration and communication.

MEMARC welcomed Noor Fifinatasha Shahedan and Nurul Aida Mortar of the Centre of Excellence in Geopolymer and Green Technology, School of Materials Engineering, Universiti Malaysia Perlis, for

the month of February. They were hosted by **Dr. Sam Tammam-Williams** and **Prof. James Ren**.

REF UPDATE

The REF2021 ‘Guidance on submissions’ and ‘Panel criteria and working methods’ have been [published](#). For FET, the following Units of Assessment (UOA) are under consideration for submission:

- UOA9 Physics
- UOA11 Computer Science & Informatics
- UOA12 Engineering
- UOA13 Architecture, Built Environment & Planning

Open Access compliance is critical for your research papers to be included in a submission, so remember to deposit your journal articles to [LJMU Research Online](#) within three months of the date of acceptance (further information [here](#)).

Staff briefings on REF2021 are scheduled to take place on the 10th & 11th April 2019 (Byrom Street campus the morning of the 11th). Further details to come soon.

NOTABLE PUBLICATIONS

(ARI) **Burke, C.**, Wich, S. (SCS), McAree, O. (SCS), **Longmore, S.**, et al. (2019) "Thermal-Drones as a Safe and Reliable Method for Detecting Subterranean Peat Fires", *Drones* 3 (1): 23, [DOI](#).

(Computer Science) **Kendrick, P., Baker, T.**, Maamar, Z., **Hussain, A.**, Buyya, R., **Al-Jumeily D.** (2018) "An Efficient Multi-Cloud Service Composition Using A Distributed Multiagent-based, Memory-driven Approach", *IEEE Transactions on Sustainable Computing*. (Early Access), [DOI](#). This is a major research output

from an international R&D collaboration with Zayed University (UAE), University of Melbourne (Australia).

(EEE) Yang, Z., Cole, K. L. H., **Qiu, Y.**, Somorjai, I. M. L., Wijesinghe, P., Nylk, J., Cochran, S. , Spalding, G. C., Lyons, D. A. and Dholakia, K. (2019) "Light sheet microscopy with acoustic sample confinement." *Nature Communications*, 10: 669, [DOI](#).

(LOOM) Ha M., **Yang, Z.** and Lam, J.S.L. (2019) "Port performance in container transport logistics: A multi-stakeholder perspective." *Transport Policy*, Vol. 73, pp. 25-40, [DOI](#).

OTHER ITEMS

(Computer Science) As General Chair, **Dr. Hoshang Kolivand** organized the 5th International Conference on Interactive Digital Media (Springer Indexed), 11th - 12th December 2018, Liverpool.

Dr. Thar Baker and **Prof. Dhiya Al-Jumeily** are organizing as Guest Editors, with a team from Carleton

University (Canada), and University of Paris 13 (Centralesupélec), France, a Special Issue on "Enabling AI Technologies for Internet of Energy" in *Transactions on Emerging Telecommunications Technologies (ETT)*, Wiley. The [call](#) is open for submission.

Faculty of Engineering and Technology

January 2019

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£260k allocated to LJMU, Renewal of LT operations grant, **Prof. Iain Steele**. STFC, 2018-19.

BEST

£10k allocated to LJMU, Housing preferences of ageing society, **Dr. Vida Maliene**. RICS Research Trust, 2019-2020.

£267k allocated to LJMU, Sensor Development Phase III, **Dr. Patryk Kot**. LSTM/Gates Foundation, 2018-2019.

EEE

£241k allocated to LJMU, Guardian-AI, **Dr. Princy Johnson** and **Dr. John Marsland**. KTP, Innovate UK with CAL Perimeters, 2019-2022.

GERI

£396k allocated to LJMU, 20001: Developing The Next Generation Of Anilox Rolls, **Dr. Martin Sharp** (PI) and **Dr. Mehdi Seddighi** (MEMARC & LOOM). Innovate UK open call with Sandon Global Engraving Technology Ltd, 2019-2021.

PROTECT/Computer Science

£11k allocated to LJMU, **Dr. Atif Waraich**, Maritime AR-Designing a Augmented Reality Maritime Content Platform. Innovate UK, Design Foundations, Jan. 2019 – Apr. 2019.

(Correction from November 2018) £176K allocated to LJMU, Mixed reality technology for interactive primary and secondary learning experience, **Dr. Martin Hanneghan** and Prof. Stephen Fairclough (SCS). KTP, Innovate UK with Immersive Interactive Ltd, 2018 – 2020.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(BEST) PhD student **Ilaria Frau** has been awarded the Excellent Paper Presentation at the 12th International Conference on Sensing Technology (ICST 2018), 4 – 6 December 2018, Limerick, Ireland. Ilaria's paper was titled "Continuous detection of copper and bromide in polluted water using f-EM sensors".

(LOOM) **Prof. Jin Wang** is the 64th annual winner of the 2018 IMechE Award for Risk Reduction in Mechanical Engineering. The Institution makes the award to the eminent engineer who has contributed most to the understanding and/or reduction of risk in any area of Mechanical Engineering and is sponsored by Holman Brothers Ltd.

Prof. Zaili Yang has been awarded the 1st North-East Asian Logistics Award jointly by Incheon National University, the Asian Association of Shipping and Logistics, and the Ministry of Oceans and Fisheries, Korea, due to his outstanding research contribution to the transport and logistics industries in the region.

(PROTECT) **Dr. Hoshang Kolivand** delivered a keynote speech on "Virtual and Augmented Reality towards Publications" at the 5th International Conference on Advancements in Graphic Design, Animation & Web Design, November 2018, London, UK.

RESEARCH IMPACT GENERATING ACTIVITIES

(BEST) **Dr. Ana Armada Bras** hosted a [RILEM](#) (International Union of Laboratories and Experts in Construction Materials, Systems and Structures) Technical Committee meeting at LJMU on 14 December 2018. The meeting focused on testing and characterisation of earth-based building materials and elements. The discussion included recent round robin tests at FET labs that will contribute to a RILEM Technical Committee State-of-the-Art Report (STAR).

This is a high-level scientific and engineering report providing cutting-edge knowledge in the field, and constitutes an important RILEM output that will support future changes in European Standards.

(LOOM) **Dr. Trung Thanh Nguyen** delivered an invited presentation at the networking workshop "Sharing findings and exploring opportunities - Data Sandbox: Improving

Network Performance”, organized by the Rail Safety and Standards Board (RSSB), December 2018. The event provided the opportunity for five universities and six rail organisations to share their current research findings and explore collaboration opportunities.

On behalf of LJMU, **Dr. Charly Lersteau and Igor Deplano** delivered two presentations to the RSSB, Merseyrail and Transport for London to update them of the progress of LJMU’s current project on anticipating and mitigating delays in railways, November 2018.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

(ARI) PhD student **Hannah Dagleish** was a finalist in the Institute of Physics’ Very Early Career Physics Communicators Award 2018.

(LOOM) PhD student **Igor Deplano** will co-lead an industry-funded project on rail modelling and optimisation together with **Dr. Trung Thanh Nguyen, Dr. Charly Lersteau, and Dr. Qian Zhang**. Industry partners include the Rail Safety and Standards Board (RSSB), Merseyrail and Network Rail.

PhD student **Cameron Kelly** was awarded “best poster presentation” at the IEEE UK & Ireland YP Postgraduate STEM Research Symposium, 28 November 2018, Chester. The poster was based on Cameron’s PhD research, titled “Investigation into the uses of Life Cycle Analysis (LCA) as an alternative method of selecting tidal power schemes”.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(BEST) **Dr. Mawada Abdellatif** recently joined the Department of Civil Engineering as Senior Lecturer in Civil Engineering (water and Environment). Prior to this appointment, she was a senior researcher at LJMU working on an ERDF project (Low Carbon Eco-Innovatory); a Lecturer at Al-Zaem Al-Azhari University (Sudan); and a Researcher at UNESCO Chair in Water Resources (Sudan). She was awarded a PhD in 2013 from LJMU and in 2005, she obtained her MSc from the University of Khartoum (Sudan). Dr. Abdellatif is interested in research areas/topics related to Climate change

and Environmental Modelling, Hydrology and Water Resources, Extremes Analysis (Flood and Drought) and Low Carbon and Sustainability.

(LOOM) **Dr. Yanfu Wang** from China University of Petroleum has recently joined Liverpool John Moores University as a visiting researcher. Her research project is “Emergency Decision Support System for Offshore Safety”, funded by the Chinese government. She will spend 11 months at LOOM, hosted by Dr. Sean Malkeson.

EXTERNAL COLLABORATION

(APM) In January 2019, **Dr. Gabriela Czanner** took up a role as the Section Methodological Lead for the National Institute for Health Research ([NIHR](#)) [Statistics Ophthalmology section](#).

(ARI) Dr. William Chantreau commenced a long-term collaboration with ARI researchers, hosted by **Prof. Nate Bastian**.

(BEST) **Dr. Maninder Pal** welcomed Dr. Hamidreza Faham of Marvdasht Azad University, Iran, for research collaboration in 2019.

Dr. Keyur Joshi has been involved in a number of recent activities in his role as North Midlands Representative for the [IEEE UK & Ireland Young Professionals](#). In July 2018, he was selected to represent the group at IEEE Region 8, Student and Young Professional Congress, Porto, Portugal. He also organized the [Young Professionals Postgraduate STEM Research Symposium](#), 28 November 2018, Chester. The Symposium was attended by a number of FET PGRs, and Dr. Joshi was able to present a prize to LOOM PhD researcher **Cameron Kelly**. Dr. Joshi also organized the “The Young

Professionals Industry Networking Evening” in collaboration with IEEE Northumbria University Student Branch, IET Northumbria Network and IET Northumbria On Campus, 7 December 2018, Newcastle upon Tyne.

(EEE) Andrea Cervone, a PhD student of the Università degli Studi di Napoli Federico II, Naples, Italy has joined the Electric Machines and Drives Research Group on 5 January for a six-month stay hosted by **Dr. Obrad Dordevic**.

(GERI) **Prof. Mike Morgan** hosted three visitors from University of Shanghai for Science and Technology (USST), China, for a 4-week visit; Prof Shuwen Wang, Chao Zhang and Liu Zhiguo. GERI also welcomes two new visitors, each for 12 months: Prof Xingyuan Xu of Henan University of Science and Technology, China, hosted by **Dr. Guangming Zhang**; and Dr Eustaquio García of University of Castilla-La Mancha, Spain, hosted by **Prof. Xun Chen**.

(MEMARC) MEMARC has welcomed two long-term visitors from China for 2019. **Dr. Sean Malkeson** and **Prof. Jin Wang** are hosting Associate Prof. Yan Wang of the Centre for

Offshore Engineering and Safety Technology, UPC, Qingdao. **Dr. Rob Darlington** hosts Dr. Yani Chen of Wuhan University of Technology.

(PROTECT) **Dr. Thar Baker** established a new R&D collaboration with the National Digital Switching System

Engineering and the Technological Research Center of China to undertake research and development in Software-defined Networks. The project is supported by the National Natural Science Foundation of China for Innovative Research Groups, and the National High Technology Research and Development Program of China.

NOTABLE PUBLICATIONS

(APM) MacCormick, I. J. C., Williams, B. M., Zheng, Y., Li, K., Al-Bander, B., **Czanner, S.**, Cheeseman, R., Willoughby, C. E., Brown, E.N., Spaeth, G.L., and **Czanner, G.** (2019) “Accurate, fast, data efficient and interpretable glaucoma diagnosis with automated spatial analysis of the whole cup to disc profile”, *PLoS ONE*, vol. 14(1), [DOI](#).

(ARI) **Darnley, M. J.**, Hounsell, R., O’Brien, T. J., Henze, M., Rodríguez-Gil, P., Shafter, A. W., Shara, M. M., Vaytet, N. M. H., Bode, M. F., Ciardullo, R., Davis, B. D., Galera-Rosillo, R., **Harman, D. J.**, **Harvey, E. J.**, **Healy, M. W.**, Ness, J.-U., Ribeiro, V. A. R. M., and Williams, S. C. (2019) “A recurrent nova super-remnant in the Andromeda galaxy”, *Nature*, 9 January 2019, [DOI](#).

(EEE) **Ma, J.**, **Chai, Z. C.**, **Zhang, W.D.**, **Zhang, J.F.**, **Marsland, J.**, Govoreanu, B., Degraeve, R., Goux, L., and Kar, G.S. (2019) “TDDB Mechanism in a-Si/TiO₂ Nonfilamentary

RRAM Device”, *IEEE Transactions on Electron Devices*, Vol. 66, No. 1, pp.777-784, [DOI](#).

(LOOM) **Wang, R.**, **Nguyen, T.T.** Li, C., **Jenkinson, I.**, **Yang, Z.**, Kavakeb, S. (2018) “Optimising discrete dynamic berth allocations in seaports using a Levy Flight based meta-heuristic”. *Swarm and Evolutionary Computation* (Impact factor: 3.82), Vol. 44, [DOI](#). This is an output of a project awarded via the Newton Fund Institutional Links. The research was also supported by a FET Dean’s Scholarship.

(PROTECT) **Bouhafs, F.**, **Mackay, M.**, **Raschella, A.**, **Shi, Q.**, den Hartog, F., Saldana, J., Munilla, R., Ruiz-Mas, J., Fernandez-Navajas, J., Almodovar, J., and van Adrichem, N. (2018) “Wi-5: A Programming Architecture for Unlicensed Frequency Bands”, *IEEE Communications Magazine*, Vol. 56, No. 12, pp. 178-185, [DOI](#). This is an output from the EU H2020 funded [Wi-5 project](#).

OTHER ITEMS

(ARI) **Dr. Dan Perley** features in a *National Geographic* [article](#), ‘Astronomers may have finally seen a star become a black hole’, written by Michael Greshko and published on 10 January 2019.

(EEE) **Prof. Emil Levi** has officially taken over the duties of the Editor-in-Chief of the *IEEE Transactions on Industrial Electronics* on 01 January 2019. For more information: <http://www.ieee-ies.org/pubs/transactions-on-industrial-electronics>

(LOOM) **Dr. Eddie Blanco-Davis** was invited as an expert speaker to attend the “Perspective of Clean Fuels on Maritime Technologies for the Reduction of GHG Emission in the Maritime Industry” workshop funded by the Panamanian Maritime Authority and the British Embassy in Panama, 12 - 14 November 2018, Panama City, Panama.

(PROTECT) **Dr. Thar Baker** is organizing as a Guest Editor, with a team from McGill University (Canada), Macquarie University (Australia), and University of Klagenfurt (Austria) a Special issue on “Enabling Technologies and Tools for Next Generation Internet Security” in the *International Journal of Sustainable Cities and Society* (Elsevier) [IF 3.073]. The [call](#) for submissions is now open. Dr. Baker is also organizing as a Guest Editor, with a team from Carleton University (Canada), Cisco System (USA), and Jordan University of Science and Technology (Jordan), a Special Issue on “Leveraging Advanced Technologies and Tools for Connected Vehicles: Challenges

and Future Trends” in *Internet Technology Letters* (Wiley). The [call](#) is now open for submissions.

(FET) Eight FET researchers have been awarded funding via the LJMU Global Challenges Research Fund (GCRF) Small Grants Fund. Research England awarded £235k to LJMU for the academic year 2018-2019, for projects supporting the economic and societal development of deprived countries. The LJMU GCRF Small Grants Fund is an internal competitive scheme, which allocates the funding to the best projects from across the University that support development of a country or countries on the OECD [DAC List](#). The following FET researchers have been awarded funding from January to June 2019, for the projects listed below:

(APM) **Dr. Gabriela Czanner**, £8k, Tanzania and India, “Network Strengthening to Improve Glaucoma Case Detection in India and Tanzania using Low Cost Retinal Images and Fully Automated Image Analysis”.

(ARI) **Dr. Helen Jermak**, £13k, Indonesia, “Using Astronomy to enhance STEM engagement in remote regions of Indonesia”.

(BEST) **Dr. Ana Armada Bras**, £13k, India, “Development of blended bioconcrete for prefabricated housing system for India whilst solving waste problems”.

Dr. Damian Fearon, £6k, Sri Lanka, “The development of an analysis framework to enable the integration of sustainable and resilient renewable energy generation for housing in Sri Lanka”.

Dr. Monower Sadique, £12k, Bangladesh, “Development of non-fired brick replacing agricultural clay by alternative materials”.

(GERI) **Prof. Xun Chen**, £12k, China, “Novel functional surface manufacturing for sustainable development”.

(LOOM) **Dr. Musa Bashir**, £6k, Egypt, “Design of Modular Hybrid Renewable Energy Floating Platform for Coastal Rural Areas”.

Dr. Chia-Hsun Chang (Co-I), £14k, Vietnam, “Proof-of-concept: Risk analysis of food supply chains (FSC) under uncertainty: Evidence from Vietnam”.