



School of Engineering

Annual Report for Research & Impact

August 2018 - July 2019



Contents

1.Foreword: Research Director	3
2.Research Students	5
3.Publications	9
3.1 Journal Articles	
3.2 Books/Chapters in Books	
3.3 Published Conference Papers	
4.Research Funding	20





1. Foreword:
Research Director
Professor Dewar Finlay

In presenting the Annual Report for the School of Engineering for the academic year 2018-2019, I am happy to report a very successful year for our research activities with particular success in winning research grants, quantity of doctoral thesis completed, development of research collaborations nationally and internationally with renowned universities, research institutes and industries and also our involvement with outreach research activities. The past year has seen us continue to work towards our vision to exploit our unique ability to merge the disciplines of technology, engineering and science to create world leading research impacting highly important global challenge areas and promoting healthy and sustainable futures for all citizens.

Our current research activities are conducted in a vibrant, collaborative research environment consisting of a multi-disciplinary group of over 150 researchers (academic staff, contract researchers and PhD researchers). Our work is broadly conducted in two overarching themes relating to the Nanotechnology and integrated Bioengineering Centre (NIBEC) and Advanced Future Materials and Manufacturing.

During the period covered by this report, we have sustained activity across all of our research themes. This is evident in a research income of £4.9M, 5 successfully completed doctoral research programs and the publication of more than 120 articles, over 90 of which appeared in peer reviewed academic journals. The period is also notable for the growth in our academic staff base which has seen our total number of staff with significant responsibility for research (SRR) grow by almost 50%. Our growth in staffing has been underpinned by several key initiatives that include the University investment of £2M in the establishment of the 'Healthcare Technology Hub'. This investment was designed to consolidate our international reputation for excellence in healthcare technology research by building on significant external income (£32M over five years) via the creation of four new academic positions.

Research activity at NIBEC continues to address key challenge areas including health technology, functional biomaterials and tissue engineering, plasma and nanotechnology, and, clean technology and water. This work has been underpinned with significant research income during the period from a range of sources that include EPSRC, EU Horizon 2020, National Institute for Health (US), Interreg and InvestNI.

Notable initiatives during the period include the continuation of the £4.9M GCRF (EPSRC funded) SAFEWATER project that focuses on the development of low-cost technologies for safe drinking water in developing regions. The project is now in its technology deployment phase with field trials, trialling NIBEC developed water purification technology, currently being conducted in Columbia, Brazil and Mexico.

Also, of note is the establishment of a state-of-the-art X-ray Photoelectron Spectroscopy (XPS) system. This EPSRC funded capital investment has been established as a unique state of the art facility, which complements NIBEC's already strong focus on materials characterisation and analytical science.

Health Technology Research has also featured strongly during the period with the continuation of several major initiatives that include the Interreg funded Eastern Corridor Medical Engineering (ECME) Centre, a researcher training focused platform with 23 PhD researchers now enrolled, 8 of whom are registered at Ulster. NIBEC has continued to build on its long track record of providing a platform for healthcare technology commercialisation as evidenced through the securing of a second round of funding for the Connected Health Innovation Centre (CHIC). This £3.4M investment will see the extension of the current provision that provides a platform for academia/industry engagement on healthcare technology innovation. The period has also seen the successful completion of a portfolio of cardiovascular focused health technology projects that include several significant H2020 projects e.g. CHESS, PATHway, IC-Health and WastCARD.

In relation to our work in the area of Advanced Future Materials and Manufacturing, a significant body of externally funded research has continued over the year. A large body of work has been undertaken as part of the €8.7M North West Centre for Advanced Manufacturing (NWCAM). NWCAM is delivering fifteen individual doctoral level R&D projects by applying advanced manufacturing technologies to enable the development of new and innovative products and processes. The program aims to create a step change in our global manufacturing competitiveness and strengthen regional economic development and impact. This activity is complimented by a plethora of other externally funded projects that include the EPSRC funded Novel High Performance Polymeric Composite Materials for Additive Manufacturing of Multifunctional Components project, along with a number of projects funded by the NI Advanced Engineering Composites Centre e.g. AERO AM2 project. Throughout the reporting period, significant work has continued on providing industrially relevant activity leading to world class impact via our partnership in the NIACE centre.

Looking forward, we are excited to report our involvement in a number of innovation projects in the Belfast Region City Deal which include leading the Digital Healthcare Technology Hub and Living Labs project and strong representation in the Advanced Manufacturing and Innovation Centre.

Further details of our research, facilities, staff profiles and research expertise can be found at <https://www.ulster.ac.uk/faculties/computing-engineering-and-the-built-environment/engineering/research>

or by contacting Ruth Holman (Academic Excellence Executive Assistant) at Email: r.holman@ulster.ac.uk; Ph: +44 28 9036 6927.



Professor Dewar Finlay
Research Director, School of Engineering.

2. Research Students

The following research students were registered on research degree programmes during 2018-19.

Surname	Thesis Title
Abdullah, -	SAFEWATER: Sensors for the detection of faecal contamination in drinking water
Afkhami, Arsalan	SAFEWATER: Household based water disinfection systems
Ahmad, Abrar	Drone based hotspot: an internet-on-the-go service for disaster management
Alessi, Bruno	Novel materials for third generation solar cells
Alkharabsheh, Salem	Development of novel mechanisms based on photo and electrodisinfection and decontamination of wastewater and drinking water
Antony Samy, Anto	Development of simulation models for additive manufacturing of polymers
Barber, Robert	Flexible skin sweat electrochemical sensing utilising laser induced graphene
Bigham, Teri	Safewater - Novel Biosensors For The Detection Of Waterborne Microbial Pathogens
Bloomfield, Noel	Development of overmolded parts in injection moulding
Casimero, Charnete	Design of smart catheter systems for the prevention of infection
Clarke, James	The development of a flexible modelling tool to enable the choice of the most cost effective manufacturing route for a given process in this case liquid moulding of a polymer composite to give a finished product
Corduas, Francesca	Development of novel smart scaffolds as potential strategies for skin wound healing
Dahale, Monali	Development of a novel textile/composite for improving crashworthiness
Dalton, Brendan	Analysis of thermal degradation in composite tooling materials
Davidson, Scot	Advancements in Detection and Classification of Anomalies in Multidimensional Biomedical Signals Using Data-Driven Techniques
Devine, Amy	Autonomous Smart Patches: New Approaches to Controlled Drug Delivery
Donnelly, Nicola	Examining the perceived benefits and limitations of patient-centered monitoring solutions for the patient and healthcare professional
Dooley, Christopher	Peptide functionalised gold nanoparticles for cancer treatment
Dsouza, Slavia Deeksha	Advanced Materials for Next Generation Solar Cells
Duffy, Sean	Development of multifunctional PEEK composite materials
Duraisamy, Shanmugha Sundaram	Advanced nanomaterials: Bifunctional non-precious metal catalysts for oxygen reduction and oxygen evolution reactions
Gillies, Aaron	Design and modelling of complex multi composite structures for airbourne applications
Hadia, Rohit	Advanced algorithms for CG Data analysis - Aterial fibrillation (AF) detection in the wearable device setting
Hardman, Andrew	Advanced multi-axial composites and microvascular networks
Harkin, Ryan	Optimisation of the laser sintering of metal parts for medical products.
Harley, Anna	Development of process simulation models for metal laser sintering.
Hegarty, Catherine	Remote telemetry of oxidative stress processes in the management of stroke: Acquisition and processing of metabolomic data
Hendawy, Nourhan	Surface chemical kinetics with low temperature atmospheric pressure plasma for plasma medicine applications in cancer treatment
Hussein, Hussein	Advanced Materials (ADM-07) - Nanofluids for solar thermal applications
Janjua, Ghalib Muhammad Waqas	Electronic/Biomedical Engineering - Blood Pressure Monioring

Jennings, Michael	The development of a new integrated diagnostics (biomarkers and ECG) via computational techniques for higher sensitivity detection of heart attacks
Kambley, Ankur	Metal quantum dots and clusters for energy applications
Karakasidis, Anastasios	Hierarchical carbon-fibre reinforced polymer (CFRP) composites utilising graphene nanoflakes
Kashyap, Apoorva	Low energy plasma radiotherapy – could this be a route to gentle and effective treatment of cancer or antibiotic resistant microbes?.
Khalid, Hesan	Exsolution of nanoparticles by plasma processing
Li, Shiyao	Improving the electrical conductivity of thermoplastic composites for aerospace and automotive structures
Lin, Wenyan	Investigation of the processing and properties of PVA filaments for the formation of microvascular channels in carbon fibre reinforced composites
Manzoor, Faisal	The Development of Conductive Polymer Composites for Medical Device Applications
McAlister, Olibhear	An investigation of thoracic impedance and various physiological parameters in development of algorithms to optimise cardiopulmonary resuscitation (CPR) effectiveness
McCallan, Niamh	Benchmark Simulation Model for An Electric Vehicle — Strategy Evaluation for Control, State Estimation, and Fault Diagnosis
McFlynn, Patrick	Development of hollow microneedle arrays for transdermal biosensing and drug delivery
McKillop, Stephen	iBioactive coatings
McLarnon, Liam	Development of optically transparent nanofibrous biomaterial scaffolds for ophthalmic tissue engineering
McMichael, Stuart	Photocatalysis: Solar Water Splitting
Meenagh, Aidan	In vitro cellular models to study the effects of waveform stimulation of cardiac tissues
Menagh, Gareth	Electroconductive electrospun polymeric biomaterial matrices for the fabrication of 3D retinal tissue
Moore, Michael	Printing of Biological Cells: 3D Printing of Biological Cells for Tissue Engineering Applications
Moses, William	Optimisation of composite properties in the third dimension-Composite reinforced composites.
Neale, Geoffrey	Improving the energy absorption capability of 3D woven composites for aerospace and automotive structures
Nguyen, Chi	Non-Orthogonal Multiple Access for 5G and Beyond Systems
Nielsen, Anne-Mette	SAFEWATER - Integrated water and sanitation in architectural design for sustainable housing in developing regions
O'Donnell, Kieran	3D printing of biological cells for tissue engineering applications
Owen, Kathryn	The Use of Ultrasound Derived Carotid Intima-Media Thickness to Predict Coronary Artery Disease
Padmanaban, Dilli Babu	Plasma synthesis of advanced nanoscale oxides for photovoltaics
Rababah, Ali	Development of multi parameter models for rapid diagnosis and treatment of cardiovascular disease
Rawlinson, Sean	New approaches to the design of electrochemical immunosensors
Rioja Cabanillas, Adriana	Investigation and development of electrocatalysts and electrochemical cells for the production of hydrogen from wastewater
Saeed, Khalid	Development of novel materials and techniques for additive manufacturing

Shah Mansouri, Tahereh	Machine learning and patterning recognition in a new sensor systems for chemical-biological detection and biomedical applications
Singh, Anukriti	Clean water: visible light active photocatalytic materials for solar water purification
Singhal, Amit	Photocatalysis: Solar phtocatalytic disinfection of water
Stinson, Harley	Additive Manufacture via Cold Metal Transfer
Ullah, Jawad	The Influence of Additives on the Processing and Properties of Polymers for Medical Device Applications
Wallace, Kerry	SAFEWATER - Innovative water disinfection technologies
Ward, Joanna	Nanotopography for dynamic platelet assay applications
Ward, Richard	Design and development of additive manufacturing process machinery for production of larger structures.
Wilson, Shannon	Titania topography for control of cell response to bioactive calcium phosphate coatings
Zhang, Xushuo	Point-of-Care Lateral Flow analysis for cystatin C-based kidney function diagnostics

Graduated December 2018

Student Name	Thesis Title
Anderson, Ashleigh	Tunable nanomaterials for controlled drug release in smart devices

Graduated July 2019

Student Name	Thesis Title
Jain, Gunisha	Compositional tuning of Zn- based semiconducting nanoparticles by atmospheric pressure plasmas and study of their optoelectronic properties
Kennedy, Alan	Automated computerised detection of Atrial Fibrillation from the Electrocardiogram
McConville, Aaron	Smart patch systems for controlled drug delivery and sensing applications
McGarrigle, Cormac	Engineered thermoplastic polymer composite filaments for through-thickness reinforcement of laminated carbon fibre composites

3. Publications

Details of all Publications by the School of Engineering are on the Ulster University's Institutional Repository- PURE <https://pure.ulster.ac.uk/>. This section reports those outputs published over the period of this report and classified as either journal articles, books/chapters in books and published conference papers.

3.1 Journal Articles

AbuMahady, I, Mohamed, EB, Ikki, S & Yanikomeroglu, H 2019, 'Sum-Rate Maximization of NOMA Systems under Imperfect Successive Interference Cancellation', *IEEE Communications Letters*, vol. 23, no. 3, 8621012, pp. 474-477.

Acheson, J, McKillop, S, Lemoine, P, Boyd, A & Meenan, BJ 2019, 'Control of Magnesium Alloy Corrosion by Bioactive Calcium Phosphate Coating: Implications for Resorbable Orthopaedic Implants', *Materialia*, vol. 6, no. C, 100291.

Aguas, Y, Hincapie, M, Sanchez, C, Botero, L & Fernandez-Ibanez, P 2018, 'Photocatalytic inactivation of *Enterobacter cloacae* and *Escherichia coli* using titanium dioxide supported on two substrates', *Processes*, vol. 6, no. 9, 6.

Alavi, SA, Mehran, K, Hao, Y, Rahimian, A, Mirsaeeedi, H & Vahidinasab, V 2019, 'A Distributed Event-Triggered Control Strategy for DC Microgrids Based on Publish-Subscribe Model Over Industrial Wireless Sensor Networks', *IEEE Transactions on Smart Grid*, vol. 10, no. 4, 8444726, pp. 4323-4337.

Alsheyab, H, Choudhury, S, Mohamed, EB & Ikki, S 2019, 'Near-Optimal Resource Allocation Algorithms for 5G+ Cellular networks', *IEEE Transactions on Vehicular Technology*, vol. 68, no. 7, 8705284, pp. 6578-6592.

Alzahrani, H, Antoine, C, Aoki, K, Baker, L, Balme, S, Bentley, C, Bhattacharya, G, Bohn, PW, Cai, Q, Cao, C, Commandeur, D, Crooks, RM, Edwards, M, Ewing, A, Fu, K, Galejeva, A, Gao, R, Hersbach, T, Hillman, R, Hu, Y-X,

Y, MacPherson, J, McKelvey, K, Minter, S, Mirkin, M, Mount, A, Nichols, R, Nogala, W, Oehl, D, Qiu, K, Ren, H, Rudd, J, Schuhmann, W, Siwy, Z, Tian, Z, Unwin, P, Wang, Y, Wilde, P, Wu, Y, Yang, Z & Ying, Y 2018, 'Processes at nanoelectrodes: general discussion', *Faraday Discussions*, vol. 210, pp. 235-265.

Alzahrani, H, Antoine, C, Baker, L, Balme, S, Bhattacharya, G, Bohn, PW, Cai, Q, Chikere, C, Crooks, RM, Das, N, Edwards, M, Ehi-Eromosele, C, Ermann, N, Jiang, L, Kanoufi, F, Kranz, C, Long, Y, MacPherson, J, McKelvey, K, Mirkin, M, Nichols, R, Nogala, W, Pelta, J, Ren, H, Rudd, J, Schuhmann, W, Siwy, Z, Tian, Z, Unwin, P, Wen, L, White, H, Willets, K, Wu, Y & Ying, Y 2018, 'Processes at nanopores and bio-nanointerfaces: general discussion', *Faraday Discussions*, vol. 210, pp. 145-171.

Askari, S, Mariotti, D, Stehr, JE, Benedikt, J, Keraudy, J & Helmersson, U 2018, 'Low-Loss and Tunable Localized Mid-Infrared Plasmons in Nanocrystals of Highly Degenerate InN', *Nano Letters*, vol. 18, no. 9, pp. 5681-5687.

Banerjee, D, Sankaran, KJ, Deshmukh, S, Ficek, M, Bhattacharya, G, Ryl, J, Phase, DM, Gupta, M, Bogdanowicz, R, Lin, I-N, Kanjilal, A, Haenen, K & Roy, SS 2019, '3D Hierarchical Boron-Doped Diamond-Multilayered Graphene Nanowalls as an Efficient Supercapacitor Electrode', *Journal Of Physical Chemistry C*, vol. 123, no. 25, pp. 15458-15466.

- Barreca, D, Gri, F, Gasparotto, A, Carraro, G, Bigiani, L, Altantzis, T, Zener, B, Lavrencic Stangar, U, Alessi, B, Babu Padmanaban, D, Mariotti, D & Maccato, C 2018, 'Multi-functional MnO₂ nanomaterials for photo-activated applications by a plasma-assisted fabrication route', *Nanoscale*, vol. 11, pp. 98-108.
- Battaglioli, S, Robinson, AJ & McFadden, S 2018, 'Influence of natural and forced gravity conditions during directional columnar solidification', *International Journal of Heat and Mass Transfer*, vol. 126, no. Part B, pp. 66-80.
- Bhardwaj, S, Pal, A, Chatterjee, K, Rana, TH, Bhattacharya, G, Roy, SS, Chowdhury, P, Sharma, GD & Biswas, S 2018, 'Fabrication of efficient dye-sensitized solar cells with photoanode containing TiO₂-Au and TiO₂-Ag plasmonic nanocomposites', *Journal of Materials Science: Materials in Electronics*, vol. 29, no. 21, pp. 18209-18220.
- Bhattacharya, G, Fishlock, S, Roy, JS, Pritam, A, Banerjee, D, Deshmukh, S, Ghosh, S, McLaughlin, J & Roy, SS 2018, 'Effective Utilization of Waste Red Mud for High Performance Supercapacitor Electrodes', *Global Challenges*, vol. 3, no. 2, 1800066.
- Bhattacharya, G, Giri, RP, Dubey, A, Mitra, S, Priyadarshini, R, Gupta, A, Mukhopadhyay, MK & Ghosh, SK 2018, 'Structural changes in cellular membranes induced by ionic liquids: From model to bacterial membranes', *CHEMISTRY AND PHYSICS OF LIPIDS*, vol. 215, pp. 1-10.
- Bigham, T, Casimero, C, Dooley, J, Ternan, NG, Snelling, WJ & Davis, J 2019, 'Microbial water quality: Voltammetric detection of coliforms based on riboflavin-ferrocyanide redox couples', *Electrochemistry Communications*, vol. 101, pp. 99-103.
- Bond, RR, Novotny, T, Andrsova, I, Koc, L, Sisakova, M, Finlay, D, Guldenring, D, McLaughlin, J, Peace, A, McGilligan, VE, Leslie, S, Wang, H & Malik, M 2018, 'Automation Bias in Medicine: The Influence of Automated Diagnoses on Interpreter Accuracy and Uncertainty when Reading Electrocardiograms', *Journal of Electrocardiology*, pp. 1-12.
- Brennan, S, Hussein, H, Makarov, DV, Shentsov, V & Molkov, V 2019, 'Pressure Effects of an Ignited Release from Onboard Storage in a Garage with a Single Vent', *International Journal of Hydrogen Energy*, vol. 44, no. 17, pp. 8927-8934.
- Cafolla, C, Farokh Payam, A & Voitchovsky, K 2018, 'A non-destructive method to calibrate the torsional spring constant of atomic force microscope cantilevers in viscous environments', *Journal of Applied Physics*, vol. 124.
- Callan, J, Nicholas, D, Logan, K, Sheng, Y, Gao, J, Farrell, S, Dixon, D, Callan, B & McHale, AP 2018, 'Rapid paper based colorimetric detection of glucose using a hollow microneedle device', *International Journal of Pharmaceutics*, vol. 547, no. 1-2, pp. 244-249.
- Casimero, C, Bigham, T, Mc Glynn, R, Dooley, JSG, Ternan, NG, Snelling, WJ, Critchley, ME, Zinkel, CL, Smith, RB, Sabogal-Paz, LP & Davis, J 2019, 'Electroanalytical Properties of Chlorophenol Red at Disposable Carbon Electrodes: Implications for Escherichia coli Detection', *Bioelectrochemistry*, vol. 130, 107321.
- Casimero, C, McConville, A, Fearon, J-J, Lawrence, C, Taylor, C, Smith, R & Davis, J 2018, 'Sensor systems for bacterial reactors: A new flavin-phenol composite film for the in situ voltammetric measurement of pH', *Analytica Chimica Acta*, vol. 1027, pp. 1-8.

- Catherwood, P, Black, B, Mohamed, EB, Cheema, AA, Rafferty, J & McLaughlin, J 2019, 'Radio Channel Characterization of Mid-band 5G Service Delivery for Ultra-Low Altitude Aerial Base Stations', *IEEE Access*, vol. 7, 8606910, pp. 8283-8299.
- Cortes, MA, Hamilton, J, Sharma, P, Brown, A, Nolan, M, Gray, KA & Byrne, J 2019, 'Formal Quantum Efficiencies for the Photocatalytic Reduction of CO₂ in a Gas Phase Batch Reactor', *Catalysis Today*, vol. 326, pp. 75-81.
- Currie, J, Bond, RR, McCullagh, P, Black, P, Finlay, D, Gallagher, S, Kearney, P, Peace, A, Stoyanov, D, Bicknell, CD, Leslie, S & Gallagher, AG 2019, 'Wearable technology-based metrics for predicting operator performance during cardiac catheterisation', *International Journal of Computer Assisted Radiology and Surgery*, vol. 14, no. 4, pp. 645-657.
- Deshmukh, S, Sankaran, KJ, Karneychuk, S, Verbeeck, J, McLaughlin, J, Haenen, K & Roy, SS 2018, 'Nanostructured nitrogen doped diamond for the detection of toxic metal ions', *Electrochimica Acta*, vol. 283, pp. 1871-1878.
- Ding, P, Chen, J, Farooq, U, Zhao, P, Soin, N, Yu, L, Jin, H, Wang, X, Dong, S & Luo, J 2018, 'Realizing the potential of polyethylene oxide as new positive tribo-material: Over 40 W/m² high power flat surface triboelectric nanogenerators', *Nano Energy*, vol. 46, pp. 63-72.
- Dooher, T, McGarrigle, C, Dixon, D, McIlhagger, A, Harkin-Jones, E & Archer, E 2018, 'Novel thermoplastic yarn for the through-thickness reinforcement of fibre-reinforced polymer composites', *Journal of Thermoplastic Composite Materials*, vol. 31, no. 12, pp. 1619-1633.
- Ferreira, AM, Tonda-Turo, C, Mancuso, E & Gentile, P 2019, 'Multilayer nanoscale functionalization to treat disorders and enhance regeneration of bone tissue', *Nanomedicine: Nanotechnology, Biology, and Medicine*, vol. 19, pp. 22-38.
- Fishlock, S, Pu, SH, Bhattacharya, G, Han, Y, McLaughlin, J, McBride, J, Chong, H & O'Shea, S 2018, 'Micromachined nanocrystalline graphite membranes for gas separation', *Carbon*, vol. 138, pp. 125-133.
- Funari, R, Bhalla, N, Chu, KY, Söderström, B & Shen, AQ 2018, 'Nanoplasmonics for Real-Time and Label-Free Monitoring of Microbial Biofilm Formation', *ACS Sensors*, vol. 3, no. 8, pp. 1499-1509.
- Ganguly, A, Benson, J & Papakonstantinou, P 2018, 'Sensitive Chronocoulometric Detection of miRNA at Screen printed Electrodes modified by gold decorated MoS₂ Nanosheets', *ACS Applied Bio Materials*, vol. 1, no. 4.
- Ganguly, A, Trovato, O, Duraisamy, SS, John Benson, Han, Y, Cristina Satriano & Papakonstantinou, P 2019, 'Organic Solvent Based Synthesis of Gold Nanoparticle - Semiconducting 2H-MoS₂ Hybrid Nanosheets', *The Journal of Physical Chemistry C*, vol. 123, no. 16, pp. 10646-10657.
- Ganya, E, Soin, N, Moloi, S, McLaughlin, J, Pong, WF & Ray, SC 2019, 'Polyacrylate-Graphene Oxide Nanocomposites for Biomedical Applications', *Journal of Applied Physics*.
- Gasparotto, A, Maccato, C, Carraro, G, Sada, C, Lavrencic Stangar, U, Alessi, B, Rocks, C, Mariotti, D, La Porta, A, Altantzis, T & Barreca, D 2019, 'Surface Functionalization of Grown-on-Tip ZnO Nanopyramids: From Fabrication to Light-Triggered Applications', *ACS Applied Materials & Interfaces*, vol. 11, no. 17, pp. 15881-15890.
- Gong, L, Duan, Q, Sun, J & Molkov, V 2019, 'Similitude analysis and critical conditions for spontaneous ignition of hydrogen release into the atmosphere through a tube', *Fuel*, vol. 245, pp. 413-419.

- Haj-Ahmad, R, Rasekh, M, Nazari, K, Onaiwu, EV, Yousef, B, Morgan, S, Evans, D, Chang, MW, Hall, J, Samwell, C & Ahmad, Z 2018, 'Stable increased formulation atomization using a multi-tip nozzle device', *Drug Delivery and Translational Research*, vol. 8, no. 6, pp. 1815-1827.
- Haq, A, Boyd, A, Acheson, J, McLaughlin, J & Meenan, BJ 2019, 'Corona discharge-induced functional surfaces of polycarbonate and cyclic olefins substrates', *Surface and Coatings Technology*, vol. 362, pp. 185-190.
- Haq, AU, Askari, S, McLister, A, Rawlinson, S, Davis, J, Chakrabarti, S, Svrcek, V, Maguire, P, Papakonstantinou, P & Mariotti, D 2019, 'Size-dependent stability of ultra-small α -/ β -phase tin nanocrystals synthesized by microplasma', *Nature Communications*, vol. 10, no. 1, 817, pp. 1-8.
- Harstad, SM, Zhao, P, Soin, N, El-Gendy, AA, Gupta, S, Pecharsky, VK, Luo, J & Hadimani, RL 2019, 'Gd 5 Si 4 -PVDF nanocomposite films and their potential for triboelectric energy harvesting applications', *AIP Advances*, vol. 9, no. 3, 035116.
- Hegarty, C, McConville, A, Mc Glynn, R, Mariotti, D & Davis, J 2019, 'Design of Composite Microneedle Sensor Systems for the Measurement of Transdermal pH', *Materials Chemistry and Physics*, vol. 227, pp. 340-346.
- Hussein, H, Brennan, S, Shentsov, V, Makarov, DV & Molkov, V 2018, 'Numerical validation of pressure peaking from an ignited hydrogen release in a laboratory-scale enclosure and application to a garage scenario', *International Journal of Hydrogen Energy*, vol. 43, no. 37, pp. 17954-17968.
- Ji, X, Chen, D, Zheng, Y, Shen, J, Guo, S & Harkin-Jones, E 2019, 'Multilayered assembly of poly(vinylidene fluoride) and poly(methyl methacrylate) for achieving multi-shape memory effects', *Chemical Engineering Journal*, vol. 362, pp. 190-198.
- Jilani, SF, Rahimian, A, Alfadhl, Y & Alomainy, A 2018, 'Low-profile flexible frequency-reconfigurable millimetre-wave antenna for 5G applications', *Flexible and Printed Electronics*, vol. 3, no. 3, 035003, pp. 1-8.
- Jung, D, Ng, M, Frisk, E & Krysanter, M 2018, 'Combining model-based diagnosis and data-driven anomaly classifiers for fault isolation', *Control Engineering Practice*.
- Li, W, Xiang, D, Wang, L, Harkin-Jones, E, Zhao, C, Wang, B & Li, Y 2018, 'Simultaneous enhancement of electrical conductivity and interlaminar fracture toughness of carbon fibre/epoxy composites using plasma treated conductive thermoplastic interleaves', *RSC Advances*.
- Li, Y, Zhang, C, Zhu, LF, Ahmad, Z, Li, JS & Chang, MW 2019, 'Elastic antibacterial membranes comprising particulate laden fibers for wound healing applications', *Journal of Applied Polymer Science*, vol. 136, no. 8, 47105.
- Liguori, A, Galligani, T, Padmanaban, DB, Laurita, R, Velusamy, T, Jain, G, Macias-Montero, M, Mariotti, D & Gherardi, M 2018, 'Synthesis of Copper-Based Nanostructures in Liquid Environments by Means of a Non-equilibrium Atmospheric Pressure Nanopulsed Plasma Jet', *Plasma Chemistry and Plasma Processing*, vol. 38, no. 6, pp. 1209-1222.
- Ling, TY, Pu, SH, Fishlock, S, Han, Y, Reynolds, J, McBride, J & Chong, H 2019, 'Sensing performance of Nanocrystalline Graphite Based Humidity Sensors', *IEEE Sensors Journal*, vol. 19, no. 14, 8668501, pp. 5421-5428.

Mancuso, E, Downey, C, Doxford-Hook, E, Bryant, MG & Culmer, P 2019, 'The use of polymeric meshes for Pelvic Organ Prolapse: current concepts, challenges and future perspectives', *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, pp. 1-19.

Mc Garrigle, C, Wegrzyn, M, McIlhagger, AT, Harkin-Jones, E & Archer, E 2019, 'Effect of extrusion parameters and nanofillers on mechanical properties of PPSU tufting yarns', *AIP Conference Proceedings*, vol. 2055, no. 1, pp. 060003-1 - 060003-5.

McConville, A, Mathur, A & Davis, J 2018, 'Palladium Nanoneedles on Carbon Fiber: Highly Sensitive Peroxide Detection for Biomedical and Wearable Sensor Applications', *IEEE Sensors*.

McLister, A, Casimero, C, McConville, A, Taylor, C, Lawrence, C, Smith, R, Mathur, A & Davis, J 2019, 'Design of a smart sensor mesh for the measurement of pH in ostomy applications', *Journal of Materials Science*, vol. 54, no. 14, pp. 10410-10419.

Mehta, P, Al-Kinani, AA, Arshad, MS, Singh, N, van der Merwe, SM, Chang, MW, Alany, RG & Ahmad, Z 2019, 'Engineering and Development of Chitosan-Based Nanocoatings for Ocular Contact Lenses', *Journal of Pharmaceutical Sciences*, vol. 108, no. 4, pp. 1540-1551.

Mirihanage, WU, Falch, KV, Casari, D, McFadden, S, Browne, DJ, Snigireva, I, Snigirev, A, Li, YJ & Mathiesen, RH 2019, 'Non-steady 3D dendrite tip growth under diffusive and weakly convective conditions', *Materialia*, vol. 5, 100215, pp. 1-8.

Mitra, S, Karri, R, Mylapalli, PK, Dey, AB, Bhattacharya, G, Roy, G, Kamil, SM, Dhara, S, Sinha, SK & Ghosh, SK 2019, 'Re-entrant direct hexagonal phases in a lyotropic system of surfactant induced by an ionic liquid', *Liquid Crystals*, vol. 46, no. 9, pp. 1327-1339.

Müller, S, Nicholson, L, Al Harbi, N, Mancuso, E, Jones, E, Dickinson, A, Wang, XN & Dalgarno, KW 2019, 'Osteogenic potential of

heterogeneous and CD271-enriched mesenchymal stromal cells cultured on apatite-wollastonite 3D scaffolds', *BMC Biomedical Engineering*, vol. 1, no. 16.

Navarro-Paredes, C, Kurth, MJ, Lamont, JV, Menown, IB, Ruddock, MW, Fitzgerald, SP & McLaughlin, J 2018, 'Diagnostic Performance of a Combination Biomarker Algorithm for Rule-Out of Acute Myocardial Infarction at Time of Presentation to the Emergency Department, Using Heart-Type Fatty Acid-Binding Protein and High-Sensitivity Troponin T tests', *Journal of Clinical and Experimental Cardiology*, vol. 9, no. 8, 1000600, pp. 1-9.

Nolan, H, Sun, D, Falzon, BG, Chakrabarti, S, Padmanaban, DB, Maguire, P, Mariotti, D, Yu, T, Jones, D & Andrews, G 2018, 'Metal nanoparticle-hydrogel nanocomposites for biomedical applications – An atmospheric pressure plasma synthesis approach', *Plasma Processes and Polymers*, vol. 15, no. 11.

Nolan, H, Sun, D, Falzon, BG, Maguire, P, Maric D, Zhang, L & Sun, D 2018, 'Thermoresponsive nanocomposites incorporating microplasma synthesized magnetic nanoparticles—Synthesis and potential applications', *Plasma Processes & Polymers*, vol. 0, no. 0, pp. e1800128.

Oakes, L, Magee, B, McIlhagger, AT & McCartney, M 2019, 'Strength prediction and mix design procedures for geopolymers and alkali-activated cement mortars comprising a wide range of environmentally responsible binder systems', *Journal of Structural Integrity and Maintenance*, vol. 4, no. 3, pp. 135-143.

Opiyo, N 2019, 'Impacts of Neighbourhood Influence on Social Acceptance of Small Solar Home Systems in Rural Western Kenya', *Energy Research and Social Science*, vol. 52, no. C, pp. 91-98.

- Pomilla, F, Cortes, MA, Hamilton, J, Molinari, R, Barbieri, G, Marci, G, Palmisano, L, Sharma, P, Brown, A & Byrne, J 2018, 'An Investigation into the Stability of Graphitic C₃N₄ as a Photocatalyst for CO₂ Reduction', *Journal Of Physical Chemistry C*, vol. 122, no. 50.
- Rababah, A, Finlay, D, Bear, L, Bond, RR, Rjoob, K & McLaughlin, J 2019, 'Interpolating Low Amplitude ECG Signals Combined with Filtering According to International Standards Improves Inverse Reconstruction of Cardiac Electrical Activity', *Lecture Notes in Computer Science*, pp. 112-120.
- Rahimian, A, Abbasi, QH, Alomainy, A & Alfadhl, Y 2019, 'A low-profile 28-GHz Rotman lens-fed array beamformer for 5G conformal subsystems', *Microwave and Optical Technology Letters*, vol. 61, no. 3, pp. 671-675.
- Rahman, E, Powner, M, Kyriacou, PA & Triantis, I 2018, 'Assessment of the Complex Refractive Indices of Xenopus leaves Sciatic Nerve for the Optimisation of Optical (NIR) Neurostimulation', *IEEE Transactions on Neural Systems and Rehabilitation Engineering*.
- Ralph, C, Lemoine, P, Boyd, A, Archer, E & McIlhagger, A 2019, 'The effect of fibre sizing on the modification of basalt fibre surface in preparation for bonding to polypropylene', *Applied Surface Science*, vol. 475, pp. 435-445.
- Ralph, C, Lemoine, P, Summerscales, J, Archer, E & McIlhagger, AT 2018, 'Relationships among the chemical, mechanical and geometrical properties of basalt fibers', *Textile Research Journal*.
- Rizzo, L, Agovino, T, Nahim-Granados, S, Castro-Alferez, M, Fernandez-Ibanez, P & Polo-Lopez, MI 2018, 'Tertiary treatment of urban wastewater by solar and UV-C driven advanced oxidation with peracetic acid: effect on contaminants of emerging concern and antibiotic resistance', *Water Research*, vol. 149, pp. 272.
- Rocks, C, Svrcek, V, Velusamy, T, Macias-Montero, M, Maguire, P & Mariotti, D 2018, 'Type-I alignment in MAPbI₃ based solar devices with doped-silicon nanocrystals', *Nano Energy*, vol. 50, pp. 245-255.
- Sancak, E, Ozen, MS, Erdem, R, Yilmaz, AC, Yuksek, M, Soin, N & Shah, T 2018, 'PA6/GÜMÜŞ karışimleri: Elektroelme ile Üretilmiş nanoliflerin mekanik ve elektromanyetik kalkanlama etkinliklerinin araştırılması', *Tekstil ve Konfeksiyon*, vol. 28, no. 3, pp. 229-235.
- Sharma, P, Cortes, MA, Hamilton, J, Han, Y, Byrne, J & Nolan, M 2019, 'Surface modification of TiO₂ with copper clusters for band gap narrowing', *Catalysis Today*, vol. 321-322, pp. 9-17.
- Song, W, Wang, H, Maguire, P & Nibouche, O 2018, 'Collaborative representation based classifier with partial least squares regression for the classification of spectral data', *Chemometrics and Intelligent Laboratory Systems*, vol. 182, pp. 79-86.
- Sun, D, McLaughlan, J, Zhang, L, Falzon, BG, Mariotti, D, Maguire, P & Sun, D 2019, 'Atmospheric Pressure Plasma-Synthesized Gold Nanoparticle/Carbon Nanotube Hybrids for Photothermal Conversion', *Langmuir*, vol. 35, no. 13, pp. 4577-4588.
- Svrcek, V, Kolenda, M, Kadys, A, Reklaitis, I, Dobrovolskas, D, Malinauskas, T, Lozach, M, Mariotti, D, Strassburg, M & Tomašiūnas, R 2018, 'Significant Carrier Extraction Enhancement at the Interface of an InN/p-GaN Heterojunction under Reverse Bias Voltage', *Nanomaterials*, vol. 8, no. 12.
- Tang, SJW, Kalavally, V, Ng, M, Tan, CP & Parkkinen, J 2018, 'Real-Time Closed-Loop Color Control of A Multi-Channel Luminaire Using Sensors Onboard A Mobile Device', *IEEE Access*.

- Tsonos, C, Zois, H, Kanapitsas, A, Soin, N, Siores, E, Peppas, GD, Pyrgioti, EC, Sanida, A, Stavropoulos, SG & Psarras, GC 2019, 'Polyvinylidene fluoride/magnetite nanocomposites Dielectric and thermal response', *Journal of Physics and Chemistry of Solids*, vol. 129, pp. 378-386.
- Tweedie, M, Sun, D, Ward, B & Maguire, P 2019, 'Long-term hydrolytically stable bond formation for future membrane-based deep ocean microfluidic chemical sensors', *Lab on a Chip*, vol. 19, no. 7, pp. 1287-1295.
- Ullah, Z, L. Kaczmarczyk, X. -Y. Zhou, Archer, E, McIlhagger, AT & Harkin-Jones, E 2019, 'A unified framework for the multi-scale computational homogenisation of 3D-textile composites', *Composites Part B: Engineering*, vol. 167, pp. 582-598.
- Vatansver Bayramol, D, Soin, N, Dubey, A, Upadhyay, RK, Priyadarshini, R, Roy, SS, Shah, TH & Anand, SC 2018, 'Evaluating the fabric performance and antibacterial properties of 3-D piezoelectric spacer fabric', *Journal of the Textile Institute*, vol. 109, no. 12, pp. 1613-1619.
- Vizcaya, P, Perpiñan, G, McEneaney, D & Escalona, OJ 2019, 'Standard ECG Lead I Prospective Estimation Study from Far-field Bipolar Leads on the Left Upper Arm: A Neural Network Approach', *Biomedical Signal Processing and Control*, vol. 51, BSPC 1471, pp. 171-180.
- Wang, L, Luo, Y, Ahmad, Z, Li, JS & Chang, MW 2018, 'Fabrication of stacked-ring netted tubular constructs via 3D template electrohydrodynamic printing', *Journal of Materials Science*, vol. 53, no. 17, pp. 11943-11950.
- Wang, L, Wang, B, Ahmad, Z, Li, JS & Chang, MW 2019, 'Dual rotation centrifugal electrospinning: a novel approach to engineer multi-directional and layered fiber composite matrices', *Drug Delivery and Translational Research*, vol. 9, no. 1, pp. 204-214.
- Wang, L, Zhang, C, Wang, HMD, Ahmad, Z, Li, JS & Chang, MW 2018, 'High throughput engineering and use of multi-fiber composite matrices for controlled active release', *Materials Today Communications*, vol. 17, pp. 53-59.
- Wu, S, Ahmad, Z, Li, JS & Chang, MW 2018, 'Controlled engineering of highly aligned fibrous dosage form matrices for controlled release', *Materials Letters*, vol. 232, pp. 134-137.
- Xiang, D, Wang, L, Tang, Y, Harkin-Jones, E, Zhao, C, Wang, P & Li, Y 2018, 'Damage self-sensing behavior of carbon nanofiller reinforced polymer composites with different conductive network structures', *Polymer*, vol. 158, pp. 308-319.
- Xing, Z, Zhang, C, Zhao, C, Ahmad, Z, Li, JS & Chang, MW 2018, 'Targeting oxidative stress using tri-needle electrospray engineered *Ganoderma lucidum* polysaccharide-loaded porous yolk-shell particles', *European Journal of Pharmaceutical Sciences*, vol. 125, pp. 64-73.
- Yadav, A, Khan, SM, Kundu, A, Soin, N, Rani, R, McLaughlin, J, Misra, DS & Hazra, K 2019, 'Vertically Aligned Few-Layered Graphene-Based Non-Cryogenic Bolometer', *C- Journal of Carbon Research*, vol. 5, no. 2, pp. 1-9.

Yao, ZC, Wang, JC, Ahmad, Z, Li, JS & Chang, MW 2019, 'Fabrication of patterned three-dimensional micron scaled core-sheath architectures for drug patches', *Materials Science and Engineering C*, vol. 97, pp. 776-783.

Yao, ZC, Wang, JC, Wang, B, Ahmad, Z, Li, JS & Chang, MW 2019, 'A novel approach for tailored medicines: Direct writing of Janus fibers', *Journal of Drug Delivery Science and Technology*, vol. 50, pp. 372-379.

Zhang, C, Ding, Q, He, H, Peng, Y, Li, C, Mai, J, Li, JS, Zhong, J & Chang, MW 2019, 'Nanoporous hollow fibers as a phantom material for the validation of diffusion magnetic resonance imaging', *Journal of Applied Polymer Science*, vol. 136, no. 23, 47617.

Zhang, C, Li, Y, Hu, Y, Peng, Y, Ahmad, Z, Li, JS & Chang, MW 2019, 'Porous yolk-shell particle engineering via nonsolvent-assisted trineedle coaxial electrospinning for burn-related wound healing', *ACS Applied Materials and Interfaces*, vol. 11, no. 8, pp. 7823-7835.

Zhao, P, Soin, N, Kumar, A, Shi, L, Guan, S, Tsonos, C, Yu, Z, Ray, SC, McLaughlin, J, Zhu, Z, Zhou, E, Geng, J, See, CH & Luo, J 2019, 'Expanding the portfolio of tribo-positive materials: aniline formaldehyde condensates for high charge density triboelectric nanogenerators', *Nano Energy*.

Zhao, C, Zhang, C, Xing, Z, Ahmad, Z, Li, JS & Chang, MW 2019, 'Pharmacological effects of natural Ganoderma and its extracts on neurological diseases: A comprehensive review', *International Journal of Biological Macromolecules*, vol. 121, pp. 1160-1178.

Zhu, LF, Chen, X, Ahmad, Z, Li, JS & Chang, MW 2019, 'Engineering of Ganoderma lucidum polysaccharide loaded polyvinyl alcohol nanofibers for biopharmaceutical delivery', *Journal of Drug Delivery Science and Technology*, vol. 50, pp. 208-216.

Zhu, LF, Li, JS, Mai, J & Chang, M-W 2019, 'Ultrasound-assisted synthesis of chitosan from fungal precursors for biomedical applications', *Chemical Engineering Journal*, vol. 357, pp. 498-507.

Zhu, LF, Yao, ZC, Ahmad, Z, Li, JS & Chang, MW 2018, 'Synthesis and Evaluation of Herbal Chitosan from Ganoderma Lucidum Spore Powder for Biomedical Applications', *Scientific Reports*, vol. 8, no. 1, 14608.

3.2 Books/Chapters in Books

Bhalla, N, Chiang, HJ & Shen, AQ 2018, Cell biology at the interface of nanobiosensors and microfluidics. in DA Fletcher, J Doh & M Piel (eds), *Methods in Cell Biology*. *Methods in Cell Biology*, vol. 148, Academic Press, pp. 203-227.

Opiyo, N 2018, Modelling Control Methods for PV-Based Communal Grids with Different Line Resistances and Impedances. in *Proceedings of the 35th EU PVSEC 2018*. pp. 1870-1875.

Burns, W, McCullagh, P, Finlay, D, Navarro-Paredes, C & McLaughlin, J 2019, Data Reduction Methods for Life-Logged Datasets. in F Chen (ed.), *Smart Assisted Living*. Springer, pp. 305-319.

Farokh Payam, A 2018, Application of Atomic Force Microscopy to Study Metal–Organic Frameworks Materials and Composites. in Springer Nature. Springer Nature, pp. 37-73.

Opiyo, N 2018, Impacts of Socio-Economic Policies on Temporal Diffusion of PV-Based Communal Grids in a Rural Developing Community. in Proceedings of the 35th EU PVSEC 2018. pp. 2182-2187.

Opiyo, N 2018, Modelling Different PV-Based Communal Grids Architectures for Rural Developing Communities. in Proceedings of the 35th EU PVSEC 2018. pp. 1859-1864.

Opiyo, N 2019, *Photovoltaic Systems Power Structures*. Lambert Academic Publishing, Germany.

Soin, N 2018, Magnetic Nanoparticles—Piezoelectric Polymer Nanocomposites for Energy Harvesting. in *Magnetic Nanostructured Materials: From Lab to Fab*. Elsevier, pp. 295-322.

3.3 Published Conference Papers

Acheson, J, Boland, E, Gallagher, L, Xu, Z, Roy, A, McKillop, S, Lemoine, P, Boyd, A & Meenan, BJ 2018, 'Hydroxyapatite Coating of Magnesium Alloys for the Tailored Degradation of Resorbable Bone Fixation Products' Annual Meeting of the European Society for Biomaterials, Maastricht, Netherlands, 9/09/18 - 13/09/18.

Acheson, J, Fullen, N, Xu, Z, Roy, A, McKillop, S, Lemoine, P, Boyd, A & Meenan, BJ 2018, 'Tailored Degradation and Improved Biocompatibility of Magnesium Alloys for Resorbable Bone Fixation Products' Paper presented at 10th Annual Symposium on Biodegradable Metals, Oxford, United Kingdom, 26/08/18 - 31/08/18.

Bhalla, N, Funari, R & Shen, AQ 2018, 'Nanoplasmonic platform for multiple biosensing applications' Paper presented at MicroTAS, Kaohsiung, Taiwan, Province of China, 28/11/18.

Ekerete, I, Nugent, C & McLaughlin, J 2019, An unobtrusive sensing solution for home based post-stroke rehabilitation. in *2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. 2018 IEEE International Conference on Bioinformatics and Biomedicine, Madrid, Spain, 3/12/18.

Funari, R, Bhalla, N, Chu, KY & Shen, AQ 2019, 'Monitoring Bacterial Biofilm Formation using LSPR Sensors for Biofilm Drug Screening' Paper presented at 7th International Symposium on Sensor Science, Napoli, Italy, 9/05/19 - 11/05/19.

Hussein, H, Brennan, S, Makarov, DV, Shentsov, V & Molkov, V 2019, Safety Considerations of an Unignited Hydrogen Release from Onboard Storage in a Naturally Ventilated Covered Car Park. in Proceedings of the Ninth International Seminar on Fire and Explosion Hazards. Vol. 2: 21-26 April 2019. pp. 1408-1422, The Ninth International Seminar on Fire and Explosion Hazards, Saint Petersburg, Russian Federation, 21/04/19.

- Jennings, M, Daniel Guldenring, Bond, RR, Rababah, A, McLaughlin, J & Finlay, D 2019, 'ST Changes Observed in Short Spaced Bipolar Leads Suitable for Patch Based Monitoring' Paper presented at Computing in Cardiology, Biopolis, Singapore, 8/09/19 - 11/09/19.
- McAlister, O, Guldenring, D, Finlay, D, Bond, RR, Torney, H, McCartney, B, Davis, L, Crawford, P & Harvey, A 2018, 'CPR Guideline Chest Compression Depths May Exceed Requirements for Optimal Physiological Response' Paper presented at Computing in Cardiology, Maastricht, Netherlands, 23/09/18 - 26/09/18, pp. 1.
- Menagh, G, Dixon, D, Lemoine, P, Rodriguez, B & Burke, G 2018, The effect of increasing dosage of atmospheric dielectric barrier plasma discharge (DBD) on the surface chemistry and topography on electrically conductive electrospun PLCL/PANI biomaterials. in *TERMIS World Congress 2018 Abstracts.*, a91424.
- Oakes, L, Magee, B, Millar, P, McIlhagger, AT & McCartney, M 2018, 'A simplified mix design procedure for geopolymers based on metakaolin and industrial waste products activated with potassium silicate' Paper presented at Civil Engineering Research in Ireland, 29/08/14.
- Puttaswamy, S, Bandla, A, Fishlock, S, Lee, C & McLaughlin, J 2019, A Clear, Delicate, Biocompatible Optical Window for Brain Imaging. in 18th International Conference on Nanotechnology, NANO 2018. vol. 2018-July, 8626270, Cork.
- Puttaswamy, S, Shi, Q, Steele, D, Fishlock, S, Lee, C & McLaughlin, J 2019, High density nanowire electrodes for Intracortical microstimulation. in *IEEE EMBC 2019*. IEEE Xplore, IEEE EMBC 2019, BERLIN, BERLIN, Germany, 23/07/19.
- Rababah, A, Finlay, D, Guldenring, D, Bond, RR & McLaughlin, J 2018, 'An Adaptive Laplacian Based Interpolation Algorithm for Noise Reduction in Body Surface Potential Maps' Paper presented at Computing in Cardiology, Maastricht, Netherlands, 23/09/18 - 26/09/18, pp. 1.
- Rafferty, J, Synnott, J, Nugent, CD, Cleland, I, Ennis, A, Catherwood, P, Orr, C, Selby, A, McDonald, G & Morrison, G 2018, Safe Beacon: A Bluetooth Based Solution to Monitor Egress of Dementia Sufferers within a Residential Setting. in UCAMl 2018: Ubiquitous Computing and Ambient Intelligence. MDPI Proceedings, no. 19, vol. 2, MDPI.
- Torney, H, Harvey, A, Magee, J, Finlay, D & Bond, RR 2018, 'Could branding influence user interface interaction on emergency medical devices? Using eye-tracking technology to assess user's visual attention when viewing public access defibrillators' ERC Congress, Bologna, Italy, 20/09/18 - 22/09/18.
- Torney, H, Harvey, A, Magee, J, Finlay, D & Bond, RR 2018, 'Does the design of a public access defibrillator affect a person's confidence to use one?' ERC Congress, Bologna, Italy, 20/09/18 - 22/09/18.
- Uhomoibhi, J, Cherner, Y, Mullett, G, Kuklja, M, Mkude, C, Fweja, L & Wang, H 2019, 'Implementation of Interactive and Adjustable Cloudbased e-Learning Tools for 21st Century Engineering Education: Challenges and Prospects' Paper presented at III IEEE World Engineering Education Conference EDUNINE2019, Lima, Peru, 17/03/19 - 20/03/19.
- Uhomoibhi, J & Hooper, L 2019, 'Digital Learning Challenges and Innovations for Sustainable Education in Developing Countries: Issues of Policy and Practice' Paper presented at INSPIRE XXIV, Twenty-fourth International Conference on Software Process Improvement Research, Education and Training, Southampton, United Kingdom, 15/04/19 - 16/04/19, pp. 103-116.

Uhomoibhi, J & Ross, M 2019, 'The Five Stage Framework for Life Long Learning in Engineering Education and Practice' Paper presented at INSPIRE XXIV, Twenty-fourth International Conference on Software Process Improvement Research, Education and Training , Southampton, United Kingdom, 15/04/19 - 16/04/19, pp. 143-153

Uhomoibhi, J, Cherner, Y, Mkude, C, Mullett, G & Cherner, T 2019, 'Activity-Based Gamified e-Learning for IoT and Energy Efficiency: Academic Education, Workforce Development, and Public Literacy' Paper presented at LINC 2019 International Conference, Boston, Massachusetts, United States, 18/06/19 - 20/06/19.

4. Research Funding

Ongoing and Active Research Projects, notably:

Unit of Assessment Member	Title of Award	Funding Body	Value	Project Dates
Prof JAD McLaughlin Dr PJ McCullagh Dr N Soin Prof CD Nugent Dr J Synott Dr I Cleland Prof D Finlay	Connected Health and Innovation Centre (CHIC)	Invest NI	£9M	2013 - 2022
Prof JAD McLaughlin Dr AR Boyd Prof B Meenan Prof CD Nugent Prof J Davis Prof D Finlay Prof R O'Kennedy, DCU Prof B Caulfield, UCD Dr R Bond	Eastern Corridor for Medical Engineering (ECME) Project	INTERREG VA	£2.71M (Part of an £8M cross-border centre award)	2017 - 2022
Prof A McIlhagger Dr E Mancuso Dr Shaun McFadden Dr Z Ullah Prof E Harkin Jones Dr D Dixon Dr D McCracken Dr JP Quinn Dr E Archer D Tormey, IT Sligo	North West Centre for Advanced Manufacturing (NW CAM)	INTERREG VA	£3.22M (Part of an £8M cross-border centre award)	2017-2022
Prof JAD McLaughlin Prof PD Maguire Prof B Meenan Prof D Finlay Dr D Guldenring Dr D McEaney, Craigavon Area Hosp Prof J Davis Dr P Catherwood Prof OJ Escalona Dr PSM Dunlop Dr D Dixon Dr AR Boyd Dr G Burke	Biodevices Proto-Typing Lab	INVEST NI	£3.6M	2015-2020

Prof P Papakonstantinou Prof JA Byrne				
Prof D Mariotti Prof PD Maguire Prof JAD McLaughlin	XPS-UPS system with in situ processing	EPSRC	£1.1M	2018-2020
Prof JA Byrne Prof JAD McLaughlin Dr P Fernandez-Ibanez Dr A Brown Prof J Davis Dr NG Ternan Dr G Burke Prof JSG Dooley Prof D Finlay Dr R Price Prof M Keenan Prof HM McNulty Prof R O'Connell Dr PSM Dunlop Dr M Ng Dr D Dixon Dr M Brennan Dr MS Gallagher	SAFEWATER – Low cost technologies for safe drinking water in developing regions	EPSRC	£4.79M	2017-2021

Portfolio of Research Grants awarded during period 1 August 2018 - 31 July 2019

Unit of Assessment Member	Title of Award	Funding Body	Value
Dr D Dixon Dr A McIlhagger Dr E Archer	KTP Programme between University of Ulster and MSO Cleland Limited	Innovate UK/INI and MSO Cleland Limited	£152,771.00
Prof OJ Escalona Dr W Duddy Prof A Smith Dr M Brennan Prof JAD McLaughlin David McEneaney, SHSCT Ivan Mendoza, Sociedad Venezolana de Jurandir Nadal, Universidade Federal do Tania Araujo, Oswaldo Cruz Institute Victor Herrera, Universidad Autinoma	Neglected vector-borne diseases with cardiac affections in Latin American ecosystems	Department for the Economy-GCRF	£19,800.00

Vilma Irazola, Instituto de Efectividad			
Dr PSM Dunlop Dr S Gaihre Dr M Long Dr M Brennan Prof JA Byrne Alan Liddle Dr F Reygadas, Cantaro Azul (NGO) Mr A Jaffrey, UU Ms C Herrera, CTA (NGO) Prof L Sabogal, University of Sao Paulo Prof M Hincapie, University of Medellin	Development of GCRF overseas partner capacity and capability toolkits and training programmes (DOCC)	Department for the Economy-GCRF	£19,800.00
Dr D Dixon Dr A McIlhagger Dr E Archer Dr PSM Dunlop	Accelerated ageing and weathering facility - Extension	NI Advanced Engineering Competence Centre	£27,175.00
Dr P Fernandez-Ibanez Prof JA Byrne	PANI Water	CEC-H2020-Pillar-Societal Challenges	£329,660.00
Prof E Harkin-Jones	AERO AM2	NI Advanced Engineering Competence Centre	£183,436.00
Prof JAD McLaughlin Prof D Finlay	Microneedles for Emergency Treatment of Synthetic Opioid Overdose	National Institute of Health - USA	£73,674.00
Dr A McIlhagger Dr D Dixon Dr E Archer Dr G Stewart, Axis Composites Mr N Bloomfield, Denroy Plastics Mr N McKribbon, Rockwell Collins Mr P Quigley, CCP Gransden Mr R Lemon, Bombardier Aerospace	Developing Effective Cost Modelling Tool for Industrial Applications	NI Advanced Engineering Competence Centre	£72,000.00

Dr R Bond Prof CBT Moore Prof D Finlay Prof JAD McLaughlin	Smart Theatre Data Science and Object Tracking for Image Guided Therapies	EPSRC via IGT	£39,641.00
Prof JAD McLaughlin	Collaborative Research Support Fund - theme Leader Digital Health (NICP)	Department for the Economy	£116,504.00