

Expertise of the CDT CAPTURE PhD Supervisors

Research areas (RAs)

RA: Optical & wireless communications, 5G, machine learning in optical systems, signal processing, vehicle communications

Aston University (this group successfully supervised >75 PhD students)

Prof. Sergei K. Turitsyn, FOSA, FInstP, - Director of the 100-strong AIPT. He has published over 300 peer reviewed journal papers and is a world-leading authority on nonlinear science with outstanding achievements in photonic technologies, high-speed optical communications, signal processing and the theory of complex systems. Supervision of 26 successfully completed PhD's; and 35 postdoctoral researchers. He has extensive management experience as PI in **63** national and international, research and industrial projects (>£32m), including *coordination* of the *cohort-based* training programmes (Erasmus Mundus Joint Master Degrees programmes SMARTNET and PIXNET (PI of Aston team), H2020 European Industrial Doctorate programmes FONTE and REAL-NET and large scale H2020 Marie S. Curie Training programme MULTIPLY.

Prof. Andrew D. Ellis, FOSA, Royal Society Wolfson Merit Award Holder, is the author of more than 200 peer reviewed journal papers and more than 25 patents in the field of optical communications. He is a Deputy Director of AIPT and successfully supervised 11 PhD students. He combines a strong industrial expertise in network operator (BT) and manufacturing (Corning) environments and a track record of academic leadership, participating in projects with a total value of £75M (£20M personally managed), inventor of the optical super-channel concept and co-founder of Pilot Photonics, and a proponent of the use of the integral approximation of nonlinear noise to enhance system performance. He currently holds an EPSRC Advanced Career Fellowship

Prof. Nick J. Doran, FOSA, has over 40 years research experience in solid state physics and photonics. He led groups on advanced optical communications at BT Labs, Aston University, Marconi and Swansea University and has published over 200 papers and holds over 20 patents on optical transmission and devices. He successfully supervised 22 PhD students. He is an established authority on nonlinear fibre transmission and devices including amplifiers and switches. He pioneered the concept of dispersion managed solitons and invented the extensively used Nonlinear Optical Loop Mirror which alone now has over 1000 citations. He has established a start-up, Solstis, that developed, manufactured and deployed the world's longest ultra-high speed optical communications system, with global sales of over £1billion. This is one of the clearest examples of the transfer of EPSRC funded research output into UK commercial exploitation.

Dr Sonia Boscolo (>120 pubs, 5 book chapters, 3 patents) is a Senior Lecturer with broad theoretical and modelling expertise in photonics and its applications across sectors. She has been the PI on 5 research projects funded by the EPSRC, Leverhulme Trust and British Council (UK). She is a Programme Director of the MSc Programme in Applied Physics. Sonia is currently the Aston's coordinator of an Erasmus Mundus Partnership programme, has recently led an Erasmus+ Mobility programme, and will be the Aston's coordinator of the new international Erasmus Mundus Joint Masters Degree Programme on *Innovative Microwave Electronics and Optics* that will start in 2019.

Dr. Wladek Forysiak is a Reader and EPSRC Manufacturing Fellow with expertise in nonlinear optics and photonics and 15 years' experience leading optical communications and nonlinear system modelling industry R&D teams in Marconi, Ericsson, and Oclaro. His current interests are in nonlinear amplifiers and transmission in high speed optical fibre communications. He has authored over 100 papers, and held ~£10M funding.

Dr S Sygletos is a Senior Lecturer (Research), formerly Marie S. Curie Fellow, and an expert in the area of optical processing with machine learning, authoring over 150 papers with £2M+ in research funding (as PI/Co-I). He is a Programme director of the International Erasmus Mundus Joint Masters Degree Programmes SMARTNET and PIXNET.

Dr. Paul Harper is a Reader with academic and industrial experience in optical fibre communications. He has been part of Solstis team that successfully implemented research innovations in the commercial optical communication systems. His current research interests are in Raman nonlinear amplifiers and high speed transmission in optical fibre communications & he has authored over 100 papers in his 20+ year research career. He also has extensive teaching experience at postgraduate and undergraduate level and is currently the Undergraduate Programme Director in the Electrical and Electronic degrees at Aston University with expertise in programme design & development.

Dr. Xiaohong Peng is a Senior Lecturer, leading the wireless communications research group at Aston. He has led research projects sponsored by EPSRC and industries such as BT, BlackBerry, Jaguar Land Rover and Xyratex, successfully supervised 8 PhD students, and authored over 100 papers. His current research projects are focused at connected systems and networks for 5G coverage, smart mobility, and autonomous vehicles. His recent projects include: Quality of Experience Models for Ultra-Dense Networks under 5G and Dynamic Connectivity for Robust Internet of Vehicles.

RA: Optical sensing & urban and rural photonic applications

Aston University (this group successfully supervised 55 PhD students)

Prof David J. Webb is a Deputy Director of AIPT and currently serves as Associate Dean for Research in the School of Engineering and Applied Sciences at Aston. He successfully supervised 17 PhD students and published around 400 papers, mainly in the field of optical sensing and has an H-index of 45 (Google scholar). Webb has a passion for early career researcher education and mentoring: he has instigated an early career academic workshop series, hosted Marie Curie fellows and, most relevant to this proposal, was coordinator of the FP7 ITN TRIPOD (€3M).

Prof Lin Zhang is well recognised by the international photonics R&D community for her leading role in research and development of novel fibre grating structures and their applications in optical fibre communications, smart sensors, microwave photonics and fibre lasers, with 450 papers published in peer-review journals and conferences, and a total of 11,000 citations and H-index of 53 by the Google Scholar. She also has 25 years' experience in teaching UG and Master programmes and supervised 25 PhD students to successful completion.

Prof Misha Sumetsky FOSA, Royal Society Wolfson Merit Award Holder is the author of more than 100 peer reviewed journal papers and more than 20 patents in the fields of optics and quantum mechanics. He combines a strong background in theoretical physics and industrial

expertise acquired at Bell Labs and OFS. He is the inventor of the surface nanoscale axial photonics (SNAP) technology. His major achievements include the development of novel types of optical micro-resonators for applications in signal processing and ultra-precise sensing technologies, research supported by the US Army Research Laboratory.

Prof. Kate Sugden is Deputy Dean for Enterprise and International in the School of Engineering and Applied Science. She has significant experience in sensing systems as well as supervising SME sponsored research projects. As someone who has previous experience in start-up companies she is able to ensure that the technology developed meets the requirements of the end-user. She has successfully supervised 8 PhD students – four of which have been industrially sponsored (with Avery, Arden Photonics, National Physics Laboratory, Oxford Lasers). She has also worked in KTP partnerships (with Optimec, Indigo Photonics, PFE Medical) and on Innovate UK projects (with partners such as BAESystems, Airbus, Oxford Lasers, Fiberlogix). Kate has been CTO of Venture Capital backed start-up companies (Oxford Fiber Tools and Indigo Photonics) and run smaller consultancy based ventures (Astasense, Livingstone Technology Management).

Dr Kaiming Zhou is a Senior Lecturer (Research) leading the AIPT Industrial Outreach Lab. He is an expert in technology and applications of fibre grating devices and sensors, authoring over 150 articles in referred journals and conferences. His current research areas include tilted fibre gratings, microfabrication with femtosecond laser and mid infrared fibre lasers for food industry applications.

Dr. Alex Rozhin (115 pubs, 10 patent applications, 4500 citations, h-index 35, PI for > £2M grant portfolio, supervised to completion 2 PhD thesis at Aston and co-supervised another 3 PhD thesis in Cambridge) is a world leading expert in functional nanomaterials, optical spectroscopy, fibre lasers, fibre communication devices and sensors, Reader in Nanotechnology, governor of Nanoscience Research Group (NRG) and a head of Nanomaterials photonic at Aston Institute of Photonic Technologies.

Dr Sergey V. Sergeyev (of 180 pubs, 4 book chapters, 6 patents, £2M+ in research funding as PI/Co-I) is an expert in polarisation laser dynamics, statistical physics, and nonlinear fibre optics. He was a PI of 14 national and international research grants (including FP7 IAPP “GRIFFON”). He is a supervisory board member of PhD training programme FP7 ITN “ICONE” and ERASMUS Mundus joint master programmes SMARTNET and PIXNET.

RA: System analytics, machine learning, AI, cloud services, software engineering, human computer interaction, security

Aston University (this group successfully supervised 103 PhD students)

Prof. D Saad, FIMA, is the Head of Mathematics and of the Nonlinearity and Complexity Research Group. He is a world-leading expert on ML, statistical physics and Bayesian methods for understanding, inferring and optimising large-scale complex systems. He has authored 180+ papers and has received £2.3M+ in research funding (as PI/Co-I).

Prof. David Lowe is Professor of Information Engineering and one of the top experts in the world in the research and development of technologies for neural networks, forecasting and pattern recognition. He was the co-inventor of a popular non-linear data modelling technique known as Radial Basis Functions. Prof. Lowe's research interests span statistical pattern analysis,

dynamical systems and non-linear time series, and neuromorphically inspired techniques, developing and applying new algorithms in machine learning, including the NeuroScale architectures in the machine learning arena, along with a novel deep-learning architecture.

Professor Hai Zhuge is a Distinguished Scientist of the Association of Computing Machinery (ACM) and a Fellow of British Computer Society. He published 3 research monographs and 110 international journal papers. He has supervised 7 postdoctoral research fellows and 30 PhD students to complete (as a main supervisor), among them 5 have become professor. He has received 3m+ national and international research and industrial funding.

Prof. Peter Sawyer is Head of Computer Science since 2017 Aston. He was Professor of Software Systems Engineering in Lancaster University and **Director of the Highwire CDT** (EP/G037582/1). During his career, Sawyer has been an investigator on 12 externally-funded research projects, including as PI the EPSRC projects REVERE (GR/M04846/01), MATREX (EP/F069227/1), SAMS (EP/K015796/1) and MODEM (EP/M006255/1). Sawyer's core research is in Software and Systems Engineering with interests in digital health and dependable systems. To date, he has graduated 13 PhD students, and has 140 peer-reviewed publications.

Dr Sotos Generalis is a Reader in Mathematics and specializes in the field of turbulent shear flow. He has over 70 publications in the list and has attracted over £1.25m in grants. He 20 years' experience in the field and his worldwide network includes Universities in the US, Japan and Europe. His current interests have extended to nonlinear optical and turbulence at the nano- and micro-scales. He has supervised 9 successful doctorate students.

Prof Yulan He has held over £8.69M research funding from the EPSRC, EU-H2020, EU-FP7, Royal Academy of Engineering, British Council and Innovate UK. She has published over 150 papers in the areas of machine learning, text and data mining. She has supervised 5 PhD students to completion and is currently supervising 4 PhD students in various stages of their studies.

Dr Amit Chattopadhyay (over 70 pubs) is a world leading expert in fluid & statistical mechanics, liquid crystals, bioinformatics, cell biology and mathematical finance. He has attracted over £3m research grant; is an Editorial Board member of the Nature and Frontiers in Mathematics & Physics group of journals. He is presently a Reader in Mathematics, supervising 6 PhD students on key areas in bioinformatics and mathematical finance.

Dr Jourdan Raykov is an expert in the area of statistical machine learning and probabilistic modelling. My main expertise is the development of rigorous tools for clustering, visualization and other types of unsupervised learning in various domains varying from Internet of Things, smart buildings, pattern recognition systems to digital health applications and others directly relevant to CAPTURE.

Dr Anikó Ekárt is a senior lecturer in Computer Science at Aston University, where she is also Associate Dean for Postgraduate Studies for the School of Engineering and Applied Science. She successfully supervised 3 PhD. Her research is focused on theory and application of artificial intelligence techniques, and in particular genetic programming and evolutionary computation. Areas of application range from health to engineering, art and economics. Engineering applications include logistics, traffic data analysis and prediction for smart cities and software engineering. She has been the leader of the Aston team on the European Commission funded projects ADVANCE (<http://www.advance-logistics.eu/>) and EXCELL (<https://www.excell-project.eu/>) and technical supervisor on the Marie Curie Fellowship INVeST, totalling over £1m

funding. She has over 80 publications, including academic journals, conference proceedings, book chapters, edited books.

Dr Peter Lewis is a Senior Lecturer in Computer Science and Director of the ERDF-funded Think Beyond Data initiative that provides an artificial intelligence R&D capability to businesses across the Midlands of England. He is interested in where AI meets society, and how to help that relationship work well. His research is often inspired by biological, social and psychological processes, and advances our understanding of how to create autonomous, socially intelligent systems, that learn and adapt on an ongoing basis. He has made significant contribution to the field of self-aware computing, including the foundational book *Self-aware Computing Systems: An Engineering Approach* in 2016. He currently supervises 10 researchers, and has a led research projects worth over £2.2m, attracting funding from the European Union, Innovate UK and commercial partners, through which his work has and has been applied in smart camera networks, interactive music, manufacturing, cloud computing, IoT, and robotics.

Dr Maria Chil is an expert in Intelligent Agents and Multi-agent systems, received awards from the international and UK funding sources including InnovateUK, EPSRC, the European Commission as well as directly from the Industry, leading research team of two post-doctoral researchers, three supervised PhD students.

Prof. Tony Clark (CEng, MBCS) Deputy Dean in SEAS is an expert in Software Engineering, Programming Languages and Software Modelling, has published over 130 peer reviewed papers and has raised over £2.5M for research and development activities including KTPs, consultancies, product development, and funding for a spin-out company producing software modelling tools where he served as Technical Director 2003-2008. Tony has successfully supervised 4 PhD students and is currently an official Research Advisor to Tata Consultancy Services Research Ltd. where he supervises a PhD student and contributes to research team leadership in the use of agent-based models for system simulation.

Dr Lucy Bastin (Senior lecturer, 110 publications, h-index 22, cited 1900 times, supervised and co-supervised 6 PhD students to completion) is an expert in urban ecology, geospatial analysis and environmental monitoring. As CI on the EU-funded projects INTAMAP, UncertWeb and GEOVIQUA, she produced innovative solutions addressing challenges such as interoperable uncertainty handling for sensor networks and web-based models, and the generation and communication of trust metrics for geospatial datasets. While on secondment to the Joint Research Centre of the European Commission she developed the Digital Observatory for Protected Areas, which assists countries in reporting progress against Aichi targets and UN SDGs. She contributes substantially to standards working groups for citizen science, data quality and environmental and ecological reporting.

Dr. Jo Lamsden is a Reader at the Computer Science department and Director of the Aston Interactive Media (AIM) Laboratory. She is also an Adjunct Professor with the Faculty of Interdisciplinary Studies at the University of New Brunswick, Canada. Her research activities cover many aspects of human computer interaction (trust in e-Commerce, mobile human computer interaction design, novel approaches to participatory design involving users who are vulnerable or who have special need, use of mobile technologies in novel capacities (e.g., as assistive devices), design of novel interaction techniques for mobile technologies, and decision support systems). Her research is very practical in nature, and can be applied across a range of domains, including but not limited to motorsport, healthcare, education, and smart cities.

RA: Renewable energy, environment & sustainability, autonomous power systems

Aston University (this group successfully supervised 104 PhD students)

Prof. Wen-Ping Cao is Chair of Electrical Power Engineering and also Head of Power Electronics, Machines and Power System Group at Aston University. He received the Royal Society Wolfson Research Merit Award from the Royal Society in 2016, the semi-finalist at the Annual MIT-CHIEF Business Plan Contest (USA) in 2015, the Dragons' Den Competition Award from Queen's University Belfast in 2014, and the Innovator of the Year Award from Newcastle University in 2013. He serves as an Editor for IEEE Transactions on Power Electronics, IEEE Transactions on Industry Applications, IEEE Industry Applications Magazine, IET Power Electronics, and Electric Power Components and Systems, as well as the Chief Editor for three Special Issues and three books. Prof. Cao is the Chairman for the IEEE Industrial Electronics Society, UKRI. His research interests include thermal analysis, power loss and fault mechanisms, energy efficiency and condition monitoring of power electronics and electric machines. He has published over 120 high-quality journal articles and over 80 conference papers (mostly in leading IEEE/IET Transactions and conferences), and has secured over £3m research funding from the EU, UK, and industry. He has supervised 9 PhD students to completion.

Prof. Tony Bridgwater is Director of the European Bioenergy Research Institute at Aston. He was Technical Director of the UK Flagship SUPERGEN Bioenergy programmes for over eight years. He has been involved in winning over £25 million in research grants, which established the foundation for the EBRI at Aston University. He has supervised 52 PhD students to completion.

Dr Philip Davies (Reader, SFHEA, CEng) has over 30 years of experience in academic and industrial research. His current focus is in water and energy technologies, including sustainable water treatment and decentralised energy systems. He has supervised to successful completion 8 PhD and 25 MSc research projects. For 5 years, he led the Research Project module for MSc programmes in Mechanical Engineering and Design at Aston University, which involved mentoring students in the ideation and proposal development stage of their research projects.

Prof. Abdul Ghani Olabi, before joining Aston University as a Chair of Mechanical Engineering and Design, he was the director and founding member of the Institute of Engineering and Energy Technologies (www.uws.ac.uk/ieet) at the University of the West of Scotland. He worked at SSRC, HIAST, CNR, CRF, DCU and UWS. Prof Olabi has supervised more than 35 PhD students to successful completion. Prof Olabi has published more than 300 papers in peer-reviewed international journals and international conferences, in addition to more than 30 book chapters. Prof Olabi is the founder of the International Conference on Sustainable Energy and Environmental Protection SEEP, www.seepconference.com, and the International Conference on Materials Science and Smart Materials MSSM, www.mssm2018.uws.ac.uk. Prof Olabi has coordinated different National, EU and International Projects. He has produced different reports to the Irish Gov. regarding: Hydrogen and Fuel Cells and Solar Energy. During the last 10 years, he secured fund from; FP6, FP7, Erasmus, Tempus, Cost-Acton, Irish Research Council, Enterprise Ireland, SEAI, Innovate UK, ETP, Local Energy Scotland and other International fund for a total of £5M

RA: New materials for environmental and healthcare engineering

Aston University (this group successfully supervised 53 PhD students)

PI - Professor Sarah Hainsworth (FREng, CEng, CSci, FIMMM, PFHEA) is Pro-Vice-Chancellor and Executive Dean for the School of Engineering and Applied Science at Aston University. She is also a Professor of Materials and Forensic Engineering. Previously she was Head of the Department of Engineering (2016-2017) and Graduate Dean (2009-2017) at the University of Leicester. Whilst she was Graduate Dean she led the revision and implementation of the postgraduate research student regulations to ensure that they fulfilled the requirements of the national Quality Assurance Agency's revised requirements for postgraduate students and reflected high quality practice in the supervision of research students at the University of Leicester. The "...effective oversight of the postgraduate research student experience" was commended as an area of good practice in the 2016 QAA Higher Education Review of the University. Her research interests are in a number of areas including energy, materials characterization and forensic engineering. She successfully supervised 17 PhD students. She has an excellent track record of leading research grant project (> £7.4m in total). She led several large scale infrastructure projects, including Advanced Microscopy Centre (£1.48m, PI), Centre of Analytical Excellence (£1.1m, CI), Advanced Structural Dynamics Evaluation Centre (£2.2m, PI, Director) that received £1.07m of government funding from the Department of Business, Industry and Skills Regional Growth Fund. The total of all the projects sums to £10.4m of funding. A key feature of Sarah's research is the interdisciplinary nature working with colleagues from Medicine, Biology, Physics, Chemistry and Geology as well as wider industry and the Home Office. She has served on an EPSRC Prioritisation panel, had a range of roles on STFC including Chair of the Engineering Panel for ISIS and Chair of the Science and Technology Facilities Council (STFC) Facilities Research and Development Panel and been member of the Scientific Advisory Council for the Helmholtz Zentrum Berlin für Materialien und Energie.

Prof Edik Rafailov – a world leading expert in laser physics and biophotonics. Prof. Rafailov heads the Optoelectronics and Biomedical Photonics Group (OBPG) of the Aston Institute of Photonics Technologies. has authored/co-authored over 450 articles in refereed journals and conference proceedings, and holds 10 UK and two US patents. His work on novel laser diodes (in collaboration with Prof. Alferov, Nobel Prize winner in 2000) was recognised in 1994 by the International Science Foundation. He previously coordinated projects worth £50M (with more than £10M awarded to his group), counting FP7 Integrated Projects FAST-DOT (€14.7M, 18 partners, including Philips, Alcatel, Thales) and NEWLED (€12.5M, 15 partners). Currently he coordinates the H2020 project Mesa-Brain (€3.3M) and an EPSRC project on compact THz based systems for neuroscience. His current interests include high-power CW and ultrashort-pulse lasers, UV/Visible/IR/MIR and THz generation, nanostructures, nonlinear and integrated optics, biomedical photonics. Prof Rafailov has supervised to completion 15 PhD students and more than 12 Marie Curie ERs/ESRs. Additionally, he has contributed training modules to several industry workshops. In terms of his supervised PhDs, all have gone onto leading careers in industry and academia.

Dr Laura Leslie is Deputy Director of the Aston Institute of Materials Research and has expertise in the design and test of medical devices and biomaterials. She successfully supervised 3 PhD students. Her work is currently funded by Innovate UK, Lord Dowding Fund and Birmingham Orthopaedic Charity with projects including the use of 3D printing in the development of orthopaedic screws and developing test methodologies for analysing the wear of novel

biomaterials. Strengths include mechanical testing (both static and dynamic) and the interaction between materials and the human body.

Dr Y Zhang has 10+ years research experiences in infrastructure materials, secures £0.9m funds as PI or co-I and published 30 high-impact journal papers in the past 6 years. Meanwhile, he has been training 6 PhD students (3 already completed PhD) and 2 Marie Curie Research Fellows with his expertise in engineering mechanics, multi-scale/multi-physics modelling and renewable construction materials.

Professor Paul D Topham (CChem FRSC SFHEA) is a Full Professor of Polymer Science, Director of the Aston Institute of Materials Research (AIMR) and Deputy Head of Chemical Engineering and Applied Chemistry (CEAC) at Aston University. Since his first contribution to science in 2005, he has published 66 research papers and 2 invited Wiley book chapters (both as corresponding author). Since starting at Aston, he has been awarded several grants as PI and CoI (including x-ray and neutron beamtime at international radiation facilities) totalling over £2.8million, and is the Secretary of the Subcommittee on Polymer Terminology for the International Union of Pure and Applied Chemistry (IUPAC)- the equivalent of the United Nations for Chemistry. He was the MacroGroup UK Young Researchers Medal 2014 recipient, is a Visiting Professor of the South China University of Technology, a Senior Fellow of the Higher Education Academy (SFHEA) and a member of the Soft Matter Panel for the Diamond Light Source. He is a Member of the MacroGroup Committee and has just successfully completed his role as the Vice-Coordinator of a large FP7-funded consortium (11 European partners, ca. 4 million euros, see below). Additionally, he was the Secretary (2008 – 2013) of Recent Appointees in Polymer Science (RAPS), and led the transformation of the network from a National activity to an International one.

Dr R. Martin is a reader in material physics and deputy director of the Aston Institute of Materials Research. He has 20 years of experience developing and characterising novel glasses and is a fellow of the Society of Glass Technology. He has a track record of developing patentable technologies and in 2016 received the international Gottardi award (from the International Commission on Glass) for *outstanding achievements in the field of glass in research and development*. Dr Martin has a successful track record of running large scale projects, supervising PDRAs and supervising 3 PhD students through to completion. He has been awarded several grants as PI and CoI (including x-ray and neutron beam-time at international radiation facilities) totalling over £4 million. He has ~60 publications primarily in the area of glass science.

Dr Andrew J. Sutherland (Reader in Organic & Polymer Chemistry, published 50 papers, 10 patents & 2 invited Wiley book chapters, secured of £1.9M funding, successfully supervised 16 PhDs) is a world leading expert in synthesising small molecules to imbue polymers with new properties for biological & materials applications. Sutherland was the Director of Training of the FP7-PEOPLE-ITN-ESTABLIS, overseeing all aspects of training for 11 PhDs and 4 PDRAs across the EU.

RA: Logistics + supply chain, servitization

Aston University (this group successfully supervised 32 PhD students)

Edward Sweeney is Professor of Logistics and Systems at Aston University, and Director of the recently established Aston Logistics & Systems Institute. His research focusses on supply chain design and integration, and has been widely published in academic journals, books and book chapters, conference papers and practitioner journals. He was elected by his peers in 2014 to chair the UK's premier network of researchers in his field – the Logistics Research Network (LRN),

part of the Chartered Institute of Logistics and Transport (CILT). Edward is also a regular keynote speaker at international business and academic conferences.

Aristides Matopoulos is a Senior Lecturer in Logistics and Supply Chain Management at Aston University and a Visiting Professor at the University of Lille 2, in France. He has led the development of the Supply Chain Readiness Level tool at Aston to assess the maturity and the capabilities of manufacturing supply chains. His research has appeared in the major Supply Chain Management/Logistics outlets. He has been involved in several research and consulting projects as a freelance consultant particularly in manufacturing, food, healthcare and humanitarian sectors.

Tim Baines is Professor of Operations Strategy at Aston Business School. He is a Chartered Engineer, Fellow of both ImechE and IET, and an acknowledged world leader on business model innovation (two of his publications having a citation count of over 2500). He has been the lead investigator on wide portfolio of projects (over £30M), most recently Gamification for Servitization (EP/K014072/1 £1.6M), and the DEAS Digital Economy NetworkPlus (£1.4M) which is being launched to develop in ECR community in the UK around advanced services business models. Previous he led the Cranfield IMRC (£5M) and was a co-founder of the Boeing IVHM Centre at Cranfield (£5M). His Centre has active collaborations with over 150 businesses, including multinationals such as Goodyear, Cisco, GE and Siemens. He has successfully supervised over 30 doctoral students.

RA: Remote sensing, wireless and RF systems, microwave devices & systems, autonomous systems, radars

University of Birmingham (this group successfully supervised >90 PhD students)

Prof M. Cherniakov, PhD, DSc, Cherniakov is the chair in Aerospace and Electronic Systems at UoB. He is a world-leading expert in radar and remote sensing technologies. Specializing in radar and remote sensing technologies, he is the founding head of the internationally recognised Microwave Integrated System Laboratory, the UK's largest university Radar research centres funded by industry and EPSRC with £600K p.a. turnover. He is the author of more than 200 publications, the editor and co-author of 3 books and the radar volume of the Encyclopaedia of Aerospace Engineering. Currently he is the Principal Investigator (PI) on strategic partnership between UoB and JLR on automotive sensors development and between 2010 and 2017, 37 JLR Patent applications have been applied for and/or granted in work supported by the MISL. He is PI on a number of EPSRC projects on passive radar imagery as well as numerous projects funded by DSTL and DTC EMRS with total budget over £3m.

Prof M. Gashinova, MSc in Mathematics, PhD in Physics, Chair in Pervasive Sensing at the UoB, is the head of research group on active and passive bistatic radar, sub-THz sensing and sensing for autonomous platforms. Currently she is a lead coordinator of PathCAD consortium project, which is part of the EPSRC/JLR strategic programme "Towards Autonomy – Smart and Connected Control – TASC) and leads a number of industrial and JLR/EPSC grants coordinating research on active and passive radar systems with particular focus on intelligent sensing from autonomous platforms. She is PI of UoB team on two recently awarded large industrially lead (JLR) Innovate UK projects covering whole range of intelligent sensing system development for the autonomous cars, including pervasive imagery, signal processing and

classification, cognitive system design and physics-based holistic simulator. She is a guest editor of IET special calls for papers, supervised 11 PhD students to their completion and currently supervises 6 PhD students, mostly industrially funded.

Dr M. Antoniou, is a Senior Lecturer at EESE where he currently leads a team of 8 research staff and researchers. He has extensive experience on radar systems and signal processing. He has more than 80 publications on areas covered in this project, 1 book chapter, and has supervised 11 research projects funded by various government and industrial bodies totalling more than £2m since his academic appointment in 2011. Grants as PI most relevant to this proposal include: 'MIMO Towed Arrays for GMTI from High Altitude Pseudo-Satellites (HAPS)', CDE 40164 (DSTL); 'MIMO sensor array for short-range, high-resolution sensing', (Jaguar Land Rover-funded PhD); 'Bistatic SAR', ESA/ EGEP/ID89 (ESA), 'SpyGLASS' – Moving target indication using bi-/multi-static passive radar (H2020).

Prof. Andy Stove has worked since 1980 on solid state radars, in particularly he has pioneered FMCW radar for Automotive Cruise Control and Obstacle Avoidance. He has also worked on the incorporation of a Doppler-based Automatic Target Classifier into a Battlefield Surveillance Radar. In 2015 he joined the University of Birmingham as an Honorary Professor. He acted as Industry Co-Chair of the Technical Group of the UK's Radar Tower of Excellence. He is sub-contractor Col on 3 large-scale projects at the UoB and JLR.

Prof Chris Baker is a chair in 'Intelligent sensor systems' at the UoB. He is a world authority on radar and most recently has been pioneering cognitive processing concepts for enabling radar based autonomy. He will lead development of automotive cognitive radar concept.

Prof Costas Constantinou (MIEEE, MInstP, CEng, CPhys), Chair in Communications Electrodynamics, is the head of the Antennas and Applied Electromagnetics Laboratory in the Communications and Sensing Research Group and Deputy Director of Research and Knowledge Transfer of College of Engineering and Physical Sciences. His research interests include optics, electromagnetic theory, radiowave propagation, mobile radio, body area networks, antennas, wireless networks, mobile ad hoc networks, mathematical modelling of communications networks and adaptive network architectures. He is the author or co-author of over 150 research publications and two patents and is past UK URSI panel chair. He is Col on the Quantum Sensors activity in the EPSRC Quantum Hub at Birmingham, and he collaborates with colleagues in physics on metamaterials.

Professor Peter Gardner (PI) (FIET, SMIEEE) is Head of the Department of Electronic, Electrical and Systems Engineering in the newly formed School of Engineering, and Leader of the Communications and Sensing Research Group. He is Principal Investigator on the EPSRC TRAVEL project and PI and head of the THz laboratory. He has over 175 publications on various aspects of microwave and mm-wave research. His research interests span microwave and mm-wave antennas, circuits and systems, including integrated active antennas, reconfigurable antennas for cognitive radio and remote road condition sensing systems. He was a member of the international steering committee for the ESF funded NewFocus, which supported collaborative research in mm-wave and THz lenses and antennas. He lectures on the European School of Antennas course on Reconfigurable Antennas and Arrays. Finally he is a founding member of the university spin-out company Smart Antenna Technologies Ltd.

RA: Rural applications of 5G, energy, autonomous vehicles and IoT

Harper Adams University (this group successfully supervised 20 PhD students)

Prof. Peter Mills (PM) is Deputy Vice-Chancellor at HAU has more than 40 years research experience graduating more than 20 PhD students and has managed > £30m of mainly Government funded research projects. Recently, he was the lead author at HAU (in collaboration with 2 other institutions) of a successful bid to BEIS for c. £18m for the creation of an Agri Tech Innovation Centre from the Govt's Agri-Tech Strategy. He will coordinate research and training on rural applications of developed technologies and will take a lead to ensure CDT impact.

Prof. Mark Rutter is Professor of Applied Animal Behaviour at HAU. He has over 30 years experience conducting research in the field of applied animal behaviour and is an internationally recognised expert in the automatic recording of ruminant behaviour. He has led research projects investigating the spatial aspects of foraging in sheep, cattle and wild deer. His current research is focussed on the role that precision livestock technologies can play in promoting sustainable livestock production and animal welfare. This includes working with industry to evaluate and improve systems that can detect oestrus and monitor the health of dairy cattle. He has secured over £2.8M of research funding and has over 150 research publications.

Prof Mike Theodorou: Chair of Anaerobic Digestion and Fermentation Technology and head of the Agriculture Centre for Sustainable energy Systems (ACSES). He has more than 120 peer reviewed publications (including Science in 2016) and a Research Gate score of 35.54, >4,300 citations and >13,000 downloads. Prof Theodorou is a leading authority on agri-tech/anaerobic microbiology. The main focus of the ACSES group is to derive energy, chemicals and clean water from lignocellulosic biomass of agricultural and municipal origins using advanced anaerobic digestion (AD) and pyrolysis mediated technologies. Since joining HAU in 2014, his group has won grant and industry funded research in excess of £3.0 M. These include awards from EPSRC (PyroAD, MacroBioCrude, Redivivus, Autofungan), BBSRC (ADconstraw), EU2020 (AgroCycle), EU Interreg IVB NW (waste to energy), DoT (LBM Demo, stage 1), Innovate KTP (Community AD), P2P (waste management strategy).

Parmjit Chima (MIAgrE, FHEA) is Head of Engineering at Harper Adams University. He is a multi-disciplinary engineer and academic with over 30 years' experience, and specialist skills and knowledge in electronics, control systems, mechatronics / robotics, embedded systems & AIDC/RFID technologies. Parmjit has managed and overseen numerous KTP and KEEN projects including three award-winning KTPs with Morgan Motors and Rolls-Royce Aerospace. Other projects managed by Parmjit, include: INSIGHT – Connected Autonomous Vehicles £2.3M; Interreg IVB – Biomass – Promoting anaerobic digestion for small scale CHP projects - £800k; Interreg IVB – EnAlgae – Acceleration of commercial scale cultivation - £900k; Knowledge Based Engineering – Key systems design automation - £200k. Parmjit's current research interests revolve around the development of disruptive autonomous systems in urban and rural environments for mobility, freight and logistics. He is Principal Investigator for a £4.8M Innovate UK funded, Project Synergy to research & develop the next generation of connected autonomous vehicle operating in a platoon or swarm formation. The project will demonstrate the effective use of smart path planning and localisation algorithms for situational awareness, new sensors systems and V2X communications technologies - a key enabler to develop intelligent and adaptable autonomous vehicles.

Dr Richard Green (MIAgrE, AMIMEchE) is the Head of Engineering Research at the National Centre for Precision Farming, the multidisciplinary group within Harper Adams University

responsible for commercial research and development work in precision farming, agricultural robotics, mechatronics, data analytics, and other industrial projects. It has a dedicated team of scientists, engineers, data analysts and programmers working on a range of commercial R&D projects for a number of customers. The Centre is based in the new Agricultural Engineering Innovation Centre that is equipped with a manufacturing workshop, electronics lab and the latest computer design facilities. Recent development work includes robotic fruit harvesting, autonomous agricultural logistics, laser weeding, non-disruptive root crop measurement, sprayer drones, Ag 4.0 data analytics and robot scouting. He has worked on and supervised in excess of 100 industrial projects focusing primarily on the development and refinement of technology and systems for commercial agricultural and off road applications. In addition to securing £1.5M of R&D funding for the NCPF he regularly works as both a consultant and for the European Union as an Expert in Agricultural Robotics and Digital Technologies.

Dr. Kit Franklin (MIAgrE) is an Agricultural Engineering Lecturer from Harper Adams University. His role includes developing undergraduate programmes, new curriculum design and development and international business development. Kit is involved in innovative agricultural engineering research focussing on “future farming systems” with the most notable project to date being the Hands Free Hectare. As co-creator and Principal Investigator he successfully managed the day-to-day running of the collaborative Innovate UK funded project. The aim of the research sets out to develop the world’s first autonomous machines to grow the first arable crop without any human intervention. From planting to harvesting the barley crop, no person entered the Hands Free Hectare. The project was recently awarded Queens Anniversary Prize 2017 for innovation in Agricultural Engineering. Kit studied MEng Agricultural Engineering and is an executive member of the council for the Institute of Agricultural Engineers, IAgE. He was awarded a “Rising Star” of UK agriculture by the Farmers Weekly in 2017.