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Profile

Senior Lecturer in Artificial Intelligence and Machine Learning, and MSc course leader for *AI for Games*. Recipient of the prestigious Rolls-Royce Pioneering Digital Award and Best Poster Award at the Rolls-Royce CFD Conference. A passionate and dedicated senior researcher with over ten years of experience in research and teaching at UK universities. Experienced in supervising undergraduate and postgraduate students, conducting research, and publishing academic papers. Author of thirteen research papers and book chapters in relevant fields. Active participant in international conferences and organisations, presenting research results and findings. Proven ability to work independently and collaboratively. Productive and responsible collaborator with industry partners on over ten successful projects. Strong track record of academic achievements and significant contributions to attract external funding. Expertise includes AI/ML, Software Engineering, Data Science, Programming, Design Optimisation, and Image/Video Processing. Committed to advancing knowledge and making a significant impact in Computer Science.

Working & Research

Senior Lecturer, Games Academy, Falmouth University | 2023 – now

- Leader of MSc programme: *MSc Artificial Intelligence for Games*
- Lead two MSc modules and one undergraduate module
- Assist in managing undergraduate modules and evaluations
- Supervise and evaluate individual/group projects at both postgraduate & undergraduate levels.
- Assist in the design and validation of the new undergraduate programme *BSc Software Engineering*
- Keep on monitoring and participate in improving course curriculum
- Participant in departmental administrative tasks and other research activities
- Supervise PhD students' research projects

Senior Research Fellow, Rolls-Royce UTC, University of Southampton | 2019 – 2023

- Conducting innovative research to enhance the aircraft engine optimisation platform, receiving the prestigious *Rolls-Royce Pioneering Digital Award* in 2020 and *Rolls-Royce CFD Conference Best Poster Award* in 2024
- Actively involved in teaching activities at both undergraduate and postgraduate levels
- Engaged in exploring potential applications of AI/ML for 3D geometry generation in aircraft engine design and optimisation
- Successfully delivered more than 10 software and tools to Rolls-Royce to advance geometry recognition, design optimisation and generation
- Participating in calls and meetings with industrial collaborators to provide practical solutions and training to engineers
- Fostering collaborative partnerships with industry leaders like Rolls-Royce plc. and esteemed technology centres, including the Aerospace Technology Institute, University of Oxford, Cambridge Fluid Dynamic Group, Loughborough University Rolls-Royce UTC, Cranfield University, and Queen's University Belfast Rolls-Royce UTC
- Actively contributing to the academic community through the publication of scientific papers and dissemination of research outcomes in peer-reviewed journals and international conferences

Research Fellow, Rolls-Royce UTC, University of Southampton | 2012 – 2019

- Engaged as a research fellow specialising in the research of 3D geometry parameterisation to design and implement novel computational techniques to enhance combustor design and optimisation processes
- Collaborating closely with engineers to incorporate industry best practices into the research
- Providing comprehensive training to engineers on the utilisation of in-house developed tools.
- Consistently achieving research objectives within the timelines, ensuring efficient progress
- Actively participating in national and international meetings, regularly presenting research findings to promote and publicise the research
- Contributing to the advancement of the field by publishing scientific papers in esteemed, peer-reviewed journals to support the research program

PhD Research, University of Gloucestershire | 2009 – 2012

- Being awarded university-funded scholarship focused on 3D human face modelling
- Investigating the characteristics of NURBS and related algorithms for face modelling
- Developing expertise in face detection algorithms, techniques, and human skin colour models
- Exploring techniques for human face modelling and face detection in colour images
- Proposing a novel 3D human face model by combining NURBS curve and surface features
- Implementing 3D human face modelling techniques for application in bio-robotics

Teaching & Supervising Experience

Senior Lecture, Falmouth University | 2023 – now

- Course leader: *MSc Artificial Intelligence for Games*
- MSc module leader: *Classical Artificial Intelligence*, *Machine Learning*
- Undergraduate module leader: *Computational Mathematics*
- Undergraduate modules: *Principle of Computing*, *Data Fundamentals*, *Computational Mathematics*, *AI/ML Fundamentals*, *Game Development*, *Major Group Game Project*, *Master's Major Dissertation*, *etc.*
- Guest lecturer: *Robotics Engineering*

PhD Supervisor, Falmouth University | 2024 – now

- Supervising two PhD candidate conducting research on the application of AI/ML

PhD Supervisor, University of Southampton | 2021 – now

- Actively supervising a PhD candidate conducting research on the application of AI/ML in 3D geometry recognition
- Published a journal paper titled "Extending Point-Based Deep Learning Approaches for Better Semantic Segmentation in CAD" in the *Journal of Computer-Aided Design*
- Received "The Best Poster Award" at Rolls-Royce CFD Conference 2024

PhD Supervisor, University of Gloucestershire | 2017 – now

- Supervising a PhD candidate conducting research on dynamic loading networks
- Published a journal paper titled "Data Flow Control for Network Load Balancing in IEEE TSN for Automation" in *IEEE Access*

Lecturer, University of Southampton | 2018 – 2020

- Module: *Introduction to Advanced Mechanical Engineering Science (AMES)*
- Designed, developed, and delivered engaging lectures to postgraduate students as part of the AMES MSc program
- Covered topics focused on practical engineering and engine component design problems

Tutor for Design Search & Optimisation II, University of Southampton | 2012 – now

- Organised students in conducting lightweight aircraft aerofoil optimisation design studies
- Provided guidance and support to students in designing their own hybridised optimisation algorithms
- Fostered a collaborative learning environment, encouraging students to explore innovative approaches in the field of aircraft aerofoil optimisation

Supervisor for Design and Computing I, University of Southampton | 2012 – 2016
- Collaborated with the lecturer to supervise and guide PhD demonstrators during lab sessions
- Instructed students on solving engineering problems using Python programming skills
- Demonstrated effective teaching methodologies to enhance students' understanding and proficiency in Python programming for engineering applications

Tutor for Design and Computing I & II, University of Southampton | 2013 – 2015
- Provided guidance and support to students in solving computational engineering problems
- Assisted students in the design and optimisation of subsonic isolated aerofoils
- Evaluated and marked students' programming codes during the final lab exam, ensuring accuracy and efficiency in their implementations

Projects

- COLIBRI: Artificial Intelligence Application for Engine Design, funded by the UK Aerospace Technology Institute (ATI).
- ENGAN: Engineering Generative Adversarial Network, funded by Rolls-Royce.
- Air-fighter Afterburner Integration in CD99, funded by the Ministry of Defence (MoD), the Royal Air Force (RAF), and Rolls-Royce.
- GEMinIDS: Design Optimisation based on Hot-Cold Mesh Transformation, funded by Rolls-Royce.
- Pedestal Tile Cooling Feed Hole Optimisation Package, funded by Rolls-Royce.
- DYNAMO: Smart System for Thermal Analysis of Combustor, funded by the European Framework Programme (FP7) CleanSky2.
- Prometheus: Geometry-centric Design and Optimisation Platform for Combustor, funded by Rolls-Royce.
- ENTAPS: Automatic Combustor Design and Optimisation, funded by Rolls-Royce Defence.

Awards

- **Rolls-Royce CFD Conference Best Poster Award**, UK | 2024
- **Rolls-Royce Pioneer Digital Award**, UK | 2020
- **PhD Scholarship**, University of Gloucestershire, UK | 2009
- **MSc with Distinction**, University of Warwick, UK | 2007
- **First Class Outstanding Scholarship**, Beijing University of Aeronautics & Astronautics | 2000

Education

- **PhD**, Computer Science, University of Gloucestershire | 2009 – 2012
- **MSc (Distinction)**, Computer Science and Applications, University of Warwick | 2007 – 2008
- **BEng**, Electrical Engineering and Automation Science, Beijing University of Aeronautics and Astronautics (BUAA, Beihang University) | 2000 – 2004

Engagement

- **Professional Member (MBCS)**: British Computer Society
- **Panel Committee Member**, ACM Technical Symposium on Computer Science Education 2024
- **Programme Committee Member**, International Symposium on Creative Computing (ISCC 2024)
- **Committee Member** for New Course Validation, Falmouth University 2024
- **Contributor** of Game Quality Forum Global 2024 Report
- **Invited Reviewer** of the Journal of Games and Culture, ACM CHI 2025 Conference
- **Invited Book Evaluator** for Cambridge University Publish Ltd.

Skills

- Extensive experience in conducting research, teaching, and supervising in UK universities.
- Demonstrated ability to work independently while maintaining a strong willingness to collaborate effectively with others.
- Exceptional time management skills, ensuring efficient completion of tasks and projects.
- Established network and successful collaborations with industry professionals, fostering strong industry connections.
- Hands-on expertise in tackling interdisciplinary research problems using cutting-edge technologies such as Artificial Intelligence, Machine Learning, Deep Learning, and scientific computation tools like NumPy, CUDA, PyTorch, and Matlab Deep Learning Toolbox.
- Proficient in utilising a range of computational engineering software, including Ansys ICEM (2D/3D meshing), Fluent (commercial CFD solver), Siemens NX (industrial CAD/CAE/CAM tool), Rolls-Royce Flownet (1D aero-thermal and aero-acoustic analysis network), Rolls-Royce SC03 (2D/3D meshing and thermal-mechanical simulation), Paraview (post-processing and visualisation), and MeshLab (3D triangular mesh processing), among others.
- Proficient in a wide range of programming languages, including C++, Python, Matlab, SQL, .Net, and HTML/JavaScript/CSS.
- Experienced in utilising tools such as SVN and Git for version control.
- Proficient in working with both Windows and Linux operating systems.

Publications

Book Chapter

Shujun Zhang, Donghui Chen, Kevin Hapeshi, Xu Zhang (2016). "3-D Modelling of Biological Systems for Biomimetics", in Eddie Y K Ng and Yuehao Luo (ed.) *Bio-Inspired Surfaces and Applications*. Singapore: World Scientific, pp. 325-392. ISBN 978-981-4704-48-9.

Journal & Conference

Gerico Vidanes, David Toal, Xu Zhang, Andy Keane, Jon Gregory, Marco Nunez. (2023) "Extending point-based deep learning approaches for better semantic segmentation in CAD". Computer-Aided Design, Vol. 166, doi: 10.1016/j.cad.2023.103629

Thomas Weichlein, Shujun Zhang, Pengzhi Li, Xu Zhang (2023). "Data Flow Control for Network Load Balancing in IEEE Time-Sensitive Networks for Automation". IEEE Access, 11, pp. 14044-14060, doi: 10.1109/ACCESS.2023.3243286.

David J.J. Toal, Xu Zhang, Andy J. Keane, Chin Yik Lee, Marco Zedda (2020). "The Potential of a Multi-fidelity Approach to Gas Turbine Combustor Design Optimization". Journal of Engineering for Gas Turbines and Power, 143 (5), doi:10.1115/1.4048654.

Xu Zhang, David J.J. Toal, Neil W. Bressloff, Andy J. Keane, Frederic Witham, Jonathan Gregory, Simon Stow, Christopher Goddard, Marco Zedda, Mark Rogers (2016). "Isothermal Combustor

Prediffuser & Fuel Injector Feed Arm Design Optimization Using the Prometheus Design System", Journal of Engineering for Gas Turbines and Power, 138(6), pp.1-19. doi:10.1115/1.4031711.

Xu Zhang, Shujun Zhang, Kevin Hapeshi (2013). "A New Parameterised Feature-based Generic 3D Human Face Model for Emotional Bio-robots", Applied Mechanics and Materials, 461, pp.838-847.

Xu Zhang, Shujun Zhang, Kevin Hapeshi (2010). "A new method for face detection in colour images for emotional bio-robots". Science China - Series E: Technological Sciences, 53(11). pp. 2983- 2988.

K. Nagabandi, S. Mills, X. Zhang, D. J. J. Toal, A. J. Keane (2017) "Surrogate-based Design Optimisation of Combustor Tile Cooling Feed Holes", Proceedings of the 2017 Gas Turbine India Conference (GTIndia2017), 7-8th Dec, Bangalore, India.

Xu Zhang, David J.J. Toal, Andy J. Keane, Simon Stow, Marco Zedda (2017) "Combustor Design Optimization Using the Prometheus Design System", 23rd International Society of Air-breathing Engines (ISABE17), 03-08 Sep, Manchester, UK.

Xu Zhang, David J.J. Toal, Neil W. Bressloff, Andy J. Keane, Frederic Witham, Jonathan Gregory, Simon Stow, Christopher Goddard, Marco Zedda, Mark Rogers (2014). "Prometheus: A Geometry-centric Optimisation System for Combustor Design", Proceedings of ASME Turbo Expo 2014: Turbine Technical Conference and Exposition, 16-20th Jun, Düsseldorf, Germany.

Xu Zhang, Leran Wang, David Toal, Andy Keane (2013). "Design Automation using NX Open: Applications in Prometheus and E-BREAK". Rolls-Royce 11th ADOS Conference, 18-19th Sep, Derby, UK.

Xu Zhang, Shujun Zhang, Kevin Hapshi (2013). "A feature-based 3D human face model for emotional bio-robots". 4th International Conference of Bionic Engineering (ICBE'13), 13-16th Aug, Nanjing, China.

David J.J. Toal, Xu Zhang, Neil W. Bressloff, Andy J. Keane (2012). "Prometheus: Embedding Knowledge & Best Practice within CAD for Combustor Design Optimisation". Rolls-Royce 10th ADOS Conference, 13-14th Sep, Winchester, UK.

Xu Zhang, Shujun Zhang (2010). "Face detection in colour images based on skin colour model and eye detection". Proceeding of 3rd International Conference of Bionic Engineering, 14-16th Sep, Zhuhai, China.