

Curriculum Vitae of Rui Pedro Carvalho

<http://www.ruicarvalho.org/>

rui.carvalho@durham.ac.uk

Office address:	Nationality:	Gender:
Department of Engineering, Durham University, Lower Mountjoy South Road, Durham DH1 3LE	Portuguese	Male
Office: E384		
Phone: ++44 (0) 191 33 42382		

ORCID ([hyperlink](#))

Google Scholar ([hyperlink](#))

Research Interests: My research develops statistical machine learning and AI methods for the automated discovery of governing equations from data (system identification), with applications ranging from chaotic systems and climate to biopharmaceutical manufacturing.

Funding and services to UKRI and the Royal Society: Member of the Royal Society Research Grants Committee (Physical Sciences, 2026–2028) and of the Royal Society International Exchanges Committee (2024–2027). Researcher Co-investigator on EPSRC grants totalling over £1.1M before my appointment at Durham. Member of the EPSRC Peer Review College (2012–). Panel member in:

- EPSRC Mathematical Sciences Prioritisation Panel on the 4th of November 2026.
- EPSRC Mathematics Prioritisation Panel Meeting on the 29th and 30th of November 2017.
- EPSRC UK Korea smart grids Panel Meeting on the 18th of February 2016.
- EPSRC Maths in Healthcare Outline Panel Meeting on the 26th of March 2015.
- EPSRC Mathematics Prioritisation Panel Meeting, on the 5th March 2014.

Impact of Research: My Communications Physics paper on automated equation discovery was the journal’s fourth most downloaded paper of 2024. I have given invited talks at the Universities of Bath, Bristol, Cambridge, Edinburgh, Durham, Imperial College London, Open University, Oxford, Southampton, Surrey, UCL, and Warwick. My work on energy networks was featured in the influential textbook ‘Networks: An Introduction’ by Mark Newman (OUP, 2010), in Phys.org (2015), MIT Technology Review (2013), and reviewed (2009) by Phillip F. Schewe, author of The Grid (National Academies Press, 2006). My work on urban networks was reviewed in Nature News (2004) by Philip Ball.

Key Collaborators: Prof. Frank Kelly, CBE, FRS (Professor of the Mathematics of Systems in the Statistical Laboratory, University of Cambridge, and Master of Christ’s College, Cambridge), Prof. Dr. rer. nat. Dr. h. c. Dirk Helbing (ETHZ, member of the German Academy of Sciences “Leopoldina”), Marcelo Masera (Head of Unit of “Energy Security” at the Institute for Energy and Transport of the Joint Research Centre, European Commission).

Meetings: I co-organised the “Cambridge Meeting on Energy Systems” on the 24th of October 2014. I co-organized a FuturICT talk at faculty level by Prof. Dirk Helbing at QMUL on the 29th March 2011, which attracted 52 attendees from seven UK Universities.

CAREER:

- March 2015–Present: Assistant Professor at the Department of Engineering, Durham University. MISCADA MSc AI for Engineering Programme Lead (February 2025–). EPSRC Researcher in Residence, CPI National Biologics Manufacturing Centre, Darlington (January 2024–April 2026). Mathematics and AI representative, Engineering Programme Scrutiny Committee (July 2026–); Mathematics representative, Engineering Programme Delivery Group (July 2024–July 2026). Ethics Representative, Engineering Department (2017–2024). Mid Career Fellow of the Durham Energy Institute.
- March 2014–February 2015: Senior Research Associate, Statistical Laboratory, University of Cambridge.
- May 2013–February 2014: Research Fellow, School of Mathematical Sciences, Queen Mary, University of London.
- May 2010–May 2013: Post-doc. Researcher Co-Investigator in the RAVEN Project, School of Mathematical Sciences, Queen Mary, University of London.
- January 2010–May 2010: Post-doc supported by ImpactQM, School of Mathematical Sciences, Queen Mary, University of London.
- January 2008–December 2009: Post-doc, Manmade EU Project, School of Mathematical Sciences, Queen Mary, University of London.
- April 2005–December 2007: Senior Research Fellow, Centre for Advanced Spatial Analysis (University College London). Researcher Co-Investigator in Novel Computation Initiative Grant EP/C513703/1.
- July 2004–March 2005: Research Fellow, Bartlett School of Graduate Studies (University College London). Researcher Co-investigator in EPSRC Platform Grant GR/S64561/01.
- April 2001–June 2004: Research Fellow, Bartlett School of Graduate Studies (University College London). Funded by EPSRC Platform Grant GR/N21376/01.
- November 1996–October 2001: PhD Student in Theoretical Physics, Instituto Superior Técnico, Lisbon, Portugal. Thesis advisors: Profs. Rui Vilela Mendes and João Seixas. Dissertation: “Coupled and extended dynamical systems. Generating complexity from simple dynamics”
- September 1993–October 1996: MSc in Mechanical Engineering, Instituto Superior Técnico, Lisbon, Portugal. Thesis advisor: Prof. João Seixas. Final Mark: A with Distinction. Dissertation: “Feigenbaum Networks”
- September 1987–July 1992: Undergraduate degree in Engineering Physics (Licenciatura), Instituto Superior Técnico, Lisbon, Portugal. ;

PUBLICATIONS:

Preprints:

- Yuzheng Zhang, Weizhen Li, **Rui Carvalho**, “Fast and principled equation discovery from chaos to climate”, arXiv:2604.11929 (2026);
- Yuzheng Zhang, **Rui Carvalho**, “py-ARGOS: A Python package for automatic, statistically principled discovery of ordinary differential equations from data”, arXiv:2610.34458 (2026).

Thomson ISI-listed peer-refereed journals:

- Weizhen Li, **Rui Carvalho**, “Automating the Discovery of Partial Differential Equations in Dynamical Systems”, Mach. Learn.: Sci. Technol. 5 035046 (2024);
- Kevin Egan, Weizhen Li, **Rui Carvalho**, “Automatically discovering ordinary differential equations from data with sparse regression”, Commun Phys 7, 20 (2024);
Fourth most downloaded paper of 2024 in Communications Physics.
- Milan Straka, **Rui Carvalho**, Gijs van der Poel, Lubos Buzna, “Analysis of Energy Consumption at Slow Charging Infrastructure for Electric Vehicles”, IEEE Access 9, 53885-53901 (2021);
- Lubos Buzna, **Rui Carvalho**, “Controlling congestion on complex networks: fairness, efficiency and network structure”, Scientific Reports 7, 9152 (2017);
- **Rui Carvalho**, Lubos Buzna, Richard Gibbens, Frank Kelly, “Critical behaviour in charging of electric vehicles”, New J. Phys. 17 (2015) 095001;
Second most downloaded paper in the NJP over the last 30 days in Oct 2015.

- **Rui Carvalho**, Lubos Buzna, Flavio Bono, Marcelo Masera, David Arrowsmith, Dirk Helbing, “Resilience of natural gas networks during conflicts, crises and disruptions”, *PLoS ONE* 9(3): e90265 (2014);
- **Rui Carvalho**, Lubos Buzna, Wolfram Just, Dirk Helbing, David Arrowsmith, “Fair sharing of resources in a supply network with constraints”, *Phys. Rev. E* **85**, 046101 (2012);
- **Rui Carvalho**, Lubos Buzna, Flavio Bono, Eugenio Gutierrez, Wolfram Just, David Arrowsmith, “Robustness of Trans-European Gas Networks”, *Phys. Rev. E* **80**, 016106 (2009);
- Michael Batty, **Rui Carvalho**, Andy Hudson-Smith, Richard Milton, Duncan Smith, Philip Steadman, “Scaling and allometry in the building geometries of Greater London”, *Eur. Phys. J. B* **63**, 303-314 (2008);
- **Rui Carvalho** and Giulia Iori, “Socioeconomic Networks with Long-Range Interaction”, *Phys. Rev. E* **78**, 016110 (2008);
- **Rui Carvalho** and Michael Batty, “The Geography of Scientific Productivity: Scaling in U.S. Computer Science”, *J. Stat. Mech.* P10012 (2006);
- **Rui Carvalho** and Michael Batty, “Encoding geometric information in road networks extracted from binary images”, *Environment and Planning B*, **32**(2), 179 - 190 (2005);
- **Rui Carvalho** and Alan Penn, “Scaling and universality in the micro-structure of urban space”, *Physica A* **332**, 539-547 (2004);
- **Rui Carvalho**, B. Fernandez, R. Vilela Mendes, “From synchronization to Multistability in two coupled quadratic maps”, *Physics Letters A* **285**, 327-338 (2001);
- **Rui Carvalho**, R. Vilela Mendes, João Seixas, “Feigenbaum Networks”, *Physica D* **126**, 27-37 (1999);

Thomson ISI-listed conference proceedings:

- Miroslav Gardlo, Lubos Buzna, **Rui Carvalho**, Richard Gibbens, Frank Kelly, Collective Effects and Performance of Algorithmic Electric Vehicle Charging Strategies, Complexity in Engineering (IEEE, COMPENG), 2018
- Lubos Buzna, **Rui Carvalho**, Flavio Bono, Marcelo Masera, David Arrowsmith *Congestion dependencies in the European gas pipeline network during crises*, Complexity in Engineering (IEEE, COMPENG), 2014
- **Rui Carvalho** and Michael Batty, *Automatic extraction of hierarchical urban networks: a micro-spatial approach*, in Computational Science - ICCS 2004: 4th International Conference (Eds Bubak, M., van Albada, G. D., Sloot, P.M. and Dongarra, J.J.), Lecture Notes in Computer Science, Springer-Verlag, Volume 3038/2004, pp 1109-1116 (2004).

Book Chapters:

- **Rui Carvalho**, “*The dynamics of the linear random Farmer model*”, in Economic Complexity: Non-linear Dynamics, Multi-agents Economies and Learning, W.A. Barnett, C. Deissenberg, G. Feichtinger (eds.), Elsevier (2004)

Conferences:

- **Rui Carvalho**, Shinichi Iida and Alan Penn, “Scaling and universality in the micro-structure of urban space”, Proceedings of the 4th International Space Syntax Symposium, London, 17-19 June 2003, Julienne Hanson (ed), Space Syntax Laboratory, University College London, (2003)
- J. Barbosa, **Rui Carvalho**, João Seixas, “A cellular automata algorithm for pattern recognition in HMPID”, Proceedings of the 6th Advanced Computing Conference in Physics Research (i.e. AIHENP’99), Heraklion, Crete, Greece (1999)

RESEARCH GRANTS AND AWARDS:

Since my appointment at Durham (March 2015), as Principal Investigator:

- PI on *AgenticARGOS: Scaling Agentic Discovery of Governing Equations*, UKRI AI Research Resource (AIRR) Gateway award on Isambard-AI, project 0261-2414-0937-1, September 2026– (10,000 GPU hours; in-kind compute, no cash);
- PI and EPSRC Researcher in Residence on Pioneering Conformalised Regression Models in Downstream Pharmaceutical Manufacturing (RIR16B221019-1), EPSRC Innovation Launchpad Network+ (University of Sheffield), hosted by the High Value Manufacturing Catapult (CPI), January 2024–April 2026 (£49,985);

- PI on an Impact Booster award, EPSRC Innovation Launchpad Network+, July 2025–February 2026 (£3,000), funding NVIDIA DGX Spark computing for machine-learning research;
- PI on *The Data Science of Vaccine Manufacturing*, July–September 2021 (£2.5K);
- PI on *Software for the Extraction of Differential Equations from Data with Applications for the COVID19 pandemic*, July–September 2020 (£2.8K).

Since my appointment at Durham, as Co-Investigator:

- CoI on Testing and Evaluating Sophisticated information and communication Technologies for enaBling scalable smart grid Deployment (TESTBED2), EU Horizon 2020 Marie Skłodowska-Curie RISE staff exchange 872172, PI Prof. Hongjian Sun, February 2020–July 2025 (£223,599 to Durham; EU contribution to the consortium €1,039,600);
- CoI on Regional Energy Strategic Modelling (RESM), Innovate UK, PI Prof. Hongjian Sun, March–May 2024 (£12,614 to Durham);
- CoI on Ubiquitous Storage Empowering Response (USER), Department for Business, Energy and Industrial Strategy, Domestic Demand-Side Response competition (Phase 2), PI Prof. Hongjian Sun, January 2019–September 2021 (£144,238 to Durham).

Doctoral studentships:

- PhD Supervisor on Development of statistical machine learning algorithms for the manufacturing of mRNA vaccines, PhD Studentship for Yuzheng Zhang, September 2022–March 2026 (£169K).

Before my appointment at Durham:

- CoI on EPSRC’s Mathematical foundations for energy networks: buffering, storage and transmission EP/I016953/2, April 2013–September 2015 (£56K award);
- Researcher Co-investigator on EPSRC’s RAVEN: Resilience, Adaptability and Vulnerability of complex Energy Networks EP/H04812X/1, May 2010–May 2013 (£355K award);
- Recognized Researcher on EPSRC’s Novel Computation Initiative grant EP/C513703/1, April 2005–December 2007. Only two awards were made and our proposal was ranked first (£330K awarded to UCL for 3+1/2 years, £1.5M total);
- Recognized Researcher on EPSRC’s Platform Grant GR/S64561/01, July 2004–March 2005 (£427K award);
- Portuguese National Science Foundation (PRAXIS XXI) Post-graduate Fellowship, 1996–2000, to conduct Postgraduate studies leading to my PhD degree;
- Portuguese National Science Foundation (JNICT) Fellowship for Young Researchers in 1992 while an undergraduate at IST;

SERVICES TO UKRI AND THE ROYAL SOCIETY:

- Member of the Royal Society Research Grants Committee (Physical Sciences), 2026–2028 (19 proposals assessed by October 2026);
- Member of the Royal Society International Exchanges Committee, 2024–2027;
- Panel member in the EPSRC Mathematical Sciences Prioritisation Panel on the 4th of November 2026;
- Panel member in the EPSRC Mathematics Prioritisation Panel Meeting on the 29th and 30th of November 2017;
- Panel member in the EPSRC-KETEP Smart Grids on the 18th of February 2016;
- Panel member in the EPSRC Maths in Healthcare Outline Panel Meeting on the 26th of March 2015;
- Panel member in the EPSRC Mathematics Prioritisation Panel Meeting on the 5th March 2014;
- Member of the EPSRC Peer Review College (September 2012 –); recognised by the EPSRC Chief Executive for ranking in the top 7% of College members for peer review in 2016/17;
- Invited to the BBSRC workshop “Digital Twins in bioscience, environmental and medical science”, September 2024;

- Invited to the DST-EPSRC Applied Mathematics Meeting 11-13th July 2012, International Centre for Mathematical Sciences (ICMS), Edinburgh;

VISITS AND RESIDENCIES:

- 20th Jun – 3rd Jul 2026. Member of the Durham Engineering delegation to China promoting the Wuhan University–Durham University Joint Institute.
- 22nd Aug – 26th Aug 2016. I visited Dr. Giacomo Como at the Department of Automatic Control in Lund (Sweden).
- 17th Oct – 18st Oct 2015. I visited Prof. James Gleeson at the University of Limerick (Ireland)
- 23rd Aug – 1st Sep 2015. I visited Dr. Giacomo Como at the Department of Automatic Control in Lund (Sweden).
- July 23 – Aug 8 2015. I visited Prof. Munther Dahleh, director of the MIT Institute for Data Systems and Society.
- Sept 29 – Oct 17 2014. Visiting scholar of Lund University during the Focus Period devoted to Dynamics and Control in Networks.
- March 2013 to 2014. Invited by Prof. Dirk Helbing to visit ETHZ (7 trips in 2013 and one trip February 2014, of 2 days each)
- 20–27 August 2011, 19–28 August 2012. Invited by Prof. Dirk Helbing (Scientific Coordinator of FuturICT) to participate on his Annual Workshop in Goldrain Castle (Goldrano, Italy).
- 1–18 May 2008. Visiting post-doctoral scientist at the Chair of Sociology, in particular of Modeling and Simulation at ETHZ;
- 15–31 January 2007. Visiting post-doctoral scientist at the Institute for Transport and Economics at Dresden University of Technology;
- 1–15 July 2005. “Thematic Institute on Information and Material Flows in Complex Networks” Goldrain Castle (Italy);
- July 19–September 17, 2004: EXYSTENCE Thematic Institute (TI) “From Many-Particle Physics to Multi-Agent Systems”, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany;
- October 2000, August 2001: “The Sciences of Complexity: From Mathematics to Technology to a Sustainable World”, International Collaborative Research Year, Centre for Interdisciplinary Research (ZIF), Bielefeld University, Germany;
- May 1998: CERN (Centre European pour Recherche Nucleaire).

MEETINGS ORGANIZED:

- I co-organised the “Cambridge Meeting on Energy Systems” on the 24th of October 2014 (12 attendants from Cambridge, Herriot-Watt and Durham).
- I co-organised a FuturICT talk at faculty level by Prof. Dirk Helbing at QMUL on the 29th March 2011, which attracted 52 attendees from seven UK Universities.

RESEARCH DEGREE SUPERVISION:

PhD, as first supervisor (completed):

- Kevin Egan (PhD awarded January 2024), co-supervised with Professor Hongjian Sun. **Now Ocean Model Research Scientist, University of Hawaii at Manoa.**
- Weizhen Li (PhD awarded November 2024), co-supervised with Professor Hongjian Sun. **Now a postdoc at Zhejiang Shuren University.**

PhD, current:

- Yuzheng Zhang (first supervisor, from October 2022; completion expected December 2026).

PhD, as second supervisor (completed):

- Monica Hernandez (2022), co-supervised with Professor Hongjian Sun.

- Emmanouil Loukarakis (2015), co-supervised with Dr. Chris Dent.

PhD, as second supervisor (ongoing):

- Haoxuan Zhang (supervisor: Dr. Lian Gan, from 2025).

Research masters:

- Daniel Martinez (MRes, 2022), first supervisor.

Doctoral examining: external examiner (University of Bristol); internal examiner (Durham University).

SELECTED PRESENTATIONS (by myself or my group):

- *The Scientific Computing seminars*, Durham University (Computer Science Department), 27th of November 2024
- *Durham Applied Mathematics Seminar*, Durham University, 20th of February 2024
- **(Invited talk)** *PDE meets Data: challenges and perspectives in model development and calibration*, University of Warwick, 18th of September 2023;
- **(Invited talk)** *IDAS/IAS week on modelling: Computer Models, Simulations, Data & Reality*, Institute of Advanced Study, Durham University, 4th of May 2023;
- *Differential Equations for Data Science 2023*, (virtual conference), 21st of February 2023;
- **(Invited talk)** *Smart Energy and Decarbonisation Summer School*, Durham University, 7th of June 2022;
- *Joint Statistical Meeting 2021 (American Statistical Association)*, (virtual conference), presentation by Kevin Egan, 12th of August 2021 (speed talk);
- *SIAM Conference on Optimization (OP21)*, (virtual conference), presentation by Kevin Egan, 21st of July 2021;
- *Symposium on Data Science and Statistics (American Statistical Association)*, (virtual conference), presentation by Kevin Egan, 4th of June 2021 (lightning talk);
- *SIAM Conference on Applications of Dynamical Systems (DS21)*, (virtual conference), presentation by Kevin Egan (session Chair), 24th of May 2021;
- **(Keynote)** *International Conference on Uncertainty Quantification and Optimisation*, virtual event, 19th November 2020;
- *Statistical Data Science*, Imperial College London, 5th of July 2017;
- **(Invited talk)** *Department of Engineering Mathematics*, University of Bristol, 19th of January 2017;
- **(Invited talk)** *Department of Automatic Control*, Lund University, 24th of August 2016;
- **(Invited talk)** *MACSI, Department of Mathematics and Statistics*, University of Limerick, 16th of October 2015;
- **(Invited talk)** *Durham Energy Institute Research Symposium*, Durham University, 30th of September 2015;
- **(Invited talk)** *Department of Automatic Control*, Lund University, 26th of August 2015;
- **(Invited talk)** *Laboratory for Information & Decision Systems*, MIT, 4th of August 2015;
- **(Invited talk)** *2nd IMA Conference on Mathematics in Finance*, University of Manchester, 18th of June 2015;
- **(Invited talk)** *NetONets2015*, a satellite meeting of NetSci 2015, Zaragoza, 1st of June 2015;
- **(Invited talk)** *EPRG Energy and Environment (E&E) Seminar*, 27th of October 2014;
- **(Invited talk)** *LCCC Focus Period on Dynamics and Control in Networks*, Lund University, 14th of October 2014;
- **(Invited talk)** *Coinets'14*, a satellite meeting of ECCS14, Lucca, 25th of September 2014;

- **(Invited talk)** *CoSyDy Meeting Dynamics of Energy Networks*, University of Bath, 12th September 2014;
- **(Invited talk)** *Cambridge Networks Day*, University of Cambridge, 23rd May 2014;
- **(Invited talk)** *Energy Research Two-Day Conference*, Open University, 3rd and 4th April 2014;
- **(Invited talk)** *CABDyN Complexity Centre*, University of Oxford, 3th December 2013;
- **(Invited talk)** *Risk and Reliability Modelling of Energy Systems*, Durham University, 13th November 2013;
- **(Invited talk)** *UCL Energy Institute*, Lunch Time Seminar, 7th November 2013;
- **(Invited talk)** *Energy Research Day Conference*, Open University, 6th March 2013;
- *ERGO Forum: Optimization in Energy Day*, ICMS, Edinburgh, 5th March 2013;
- **(Invited talk)** *Risk and Reliability Modelling of Energy Systems*, Durham University, 27th November 2012;
- **(Invited talk)** *Emerging TOGETHER Science for Efficient Buildings*, UCL Energy Institute, 30th October 2012;
- **(Invited talk)** *Workshop on Information Flows and Information Bottlenecks*, Queen Mary, University of London, 12th September 2012;
- **(Invited talk)** *Graph-theoretic methods in electrical power systems*, University of Southampton, 19th-20th June 2012;
- **(Invited talk)** *The ERIE EPSRC Project seminar series*, University of Surrey, 28th September 2011;
- *Researcher's Night*, Queen Mary, University of London, 23th September 2011;
- International Workshop on Coping with Crises in Complex Socio-Economic Systems, ETHZ, 20th June 2011;
- **(Invited talk)** *The Brooke Sessions seminar series*, Bath Centre for Nonlinear Mechanics, University of Bath, 11 June 2011;
- **(Invited talk)** *Making It Real seminar series*, Department of Engineering Mathematics, University of Bristol, 26 November 2010;
- Dynamic Days Europe 2010, University of Bristol, 7 September 2010;
- **(Invited talk)** PGR Seminar, Department of Computer Science, University of Bath, 6 November 2009;
- **(Invited talk)** European Conference on Complex Systems 2009 (ECCS '09), University of Warwick, 21-25 September 2009;
- International Workshop on Network Science (NetSci09), Venice, 29 June to 3 July 2009;
- **(Invited talk)** CABDyN Network Journal Club, Oxford University, 12 October 2007;
- European Conference on Complex Systems 2007 (ECCS '07), TU Dresden, 1-5 October 2007;
- European Conference on Complex Systems 2006 (ECCS '06), University of Oxford, 26-29 September 2006;
- Complex Behavior in Economics: Modeling, Computing and Mastering Complexity", La Baume-les-Aix, Aix en Provence, 18 May 2006;
- Physics and the City, University of Bologna, 15-17 December 2005;
- EU Thematic Institute on "Information and Material Flows in Complex Networks", Goldrain Castle, 27 June 2005;
- Association of American Geographers Annual Meeting, AAG 2005, Denver, CO, 6 April 2005;
- EU Thematic Institute on "From Many-Particle Physics to Multi-Agent Systems", Max Planck Institute for the Physics of Complex Systems, Dresden, 30 August 2004
- The Sciences of Complexity: From Mathematics to Technology to a Sustainable World, ZIF, Universität Bielefeld, August 2001.

OTHER SCIENTIFIC ACTIVITIES:

- Official Nominator for the VinFuture Prize (since December 2023);
- Reviewer for *Nature Communications* and *Communications Physics* (4 reviews in 2026), *PNAS* (1 review), *IEEE Transactions on Control of Network Systems* (2 reviews), *IEEE Transactions on Power Systems* (1 review), *SN Applied Sciences* (1 review), *Journal of Complex Networks* (1 review), *IMA Journal of Applied Mathematics* (1 review), *Proceedings of ICE - Energy* (1 review), *New Journal of Physics* (1 review), *European Physical Journal B* (2 reviews), *Physica A* (1 review), *Physica Scripta* (7 reviews), *Advances in Complex Systems* (1 review), *Journal of Economic Behavior & Organization* (1 review), *Environment and Planning B* (14 reviews), *Computers Environment and Urban Systems* (1 review), *Urban Studies* (2 reviews) and *Journal on Urban Sustainable Development* (1 review);
- Grant reviewer for the *Netherlands Organisation for Scientific Research (NWO)* (1 review) and the *Israel Science Foundation* (1 review).

UNDERGRADUATE PROJECT SUPERVISION:

MEng and BEng final-year projects (29 since 2015/16: 27 MEng, 2 BEng):

- Samuel Stride, ‘Specialised AI Assistants for the Interpretation of Biopharmaceutical Data’, MEng 2026, **IMEchE Best Project Certificate (2026)**
- Harry Turner, ‘Development and Evaluation of a Multi-agent Scientific AI Assistant’, MEng 2026
- William Nielsen, ‘Teaching AI to Do Science: Using AI to Automate the Role of a Laboratory Assistant’, MEng 2026
now Graduate Verification Engineer at Fractile (October 2026)
- Tim Roberts, ‘An Autonomous Multi-Agent System for Chromatography Analysis and Report Generation’, MEng 2026
now Contractor UK Ministry of Defence (October 2026)
- Isla Innes, ‘Automated Researcher’,
now Technology Analyst at Morgan Stanley (October 2025)
- Zane Khambatta, ‘Forecasted Volatility with DtACI Intervals’
now Consultant at Oxbow Partners (October 2026)
- George Bennett, ‘Feature-Driven Modelling for Chromatography Optimisation’
- Eamon Devlin, ‘Evaluating Large Language Models for Civil Engineering Research and Report Generation: A Comparative Analysis’
now Operations Analyst at GSA (September 2024)
- Fawaz Zaman, ‘Autonomous Agent for Life Sciences Data Analysis and Paper Generation’
now Associate Consultant at OC&C Strategy Consultants (September 2024)
- Amber Gosling, ‘Pioneering Conformalised Regression Models in Downstream Pharmaceutical Manufacturing’
now Managed Services Graduate Engineer at Smarter Grid Solutions (October 2024)
- Joel Thomson, ‘ARIMA-based time series forecasting for EV charging times in the Netherlands’, MEng 2022,
now Commercial Banking Graduate at NatWest Group (September 2022)
- Barney Henton, ‘Development of Virtual Tools for Education and Collaboration using the Unreal Engine’, MEng 2022,
now Technical Business Analyst at Acturis (September 2022)
- Alex Forbes-Leith, ‘Electric Vehicle Charge Point Availability Forecasting Using Seasonal Autoregressive Integrated Moving Average Models’, MEng 2022,
now Analyst at Rothschild & Co (September 2022)
- Oliver Platt, ‘A Novel Approach to ARIMA Modelling Applied to EV Charging Stations Using Socio-Economic Data’, MEng 2021,
now Senior Data Scientist at Fintech Sandpit (September 2021)
- Lars Ødegaard Bentsen, ‘Model selection toolbox for the prediction of EV charging stations from socio-economic data’, MEng 2020,
now PhD Student at the University of Oslo (November 2020)

- Lewis Smith, ‘Automatic extraction of equations from data on a sparse basis’, MEng 2020
now Associate Systems Engineer @Cisco (November 2020)
- Benjamin Culverwell, ‘A data-driven analysis of electric vehicle charging behaviour’, MEng 2018
now Investment Banking Analyst at Houlihan Lokey (June 2019)
- Benjamin Rodman, ‘EV Charging Point Linear Predictive Model Development and Interpretation’, MEng 2018
now Consultant at FTI Consulting (June 2019)
- Francesc Mora, ‘Data Analysis and Data-Centric Modelling in Energy and Transport’, MEng 2018
now Business Analyst for European Development at Lightsource BP (June 2019)
- William Rigby, ‘Data Analysis and Data-Centric Modelling in Energy and Transport’, MEng 2018
now Technical Business Analyst for Acturis (June 2019)
- William Stephenson, ‘Critical Behaviour in the Charging of Plug-In Electric Vehicles Using Optimal Power Flow’, MEng 2018
now Incoming Energy Technologies student at the University of Cambridge (June 2019)
- April Chen, ‘Compressed Sensing: Electricity Consumption Data’, MEng 2017
now Data and Analytics Associate at PwC (June 2019)
- Benjamin Tucker, ‘Pricing Strategies on electric vehicle charging stations for the management of network congestion’, MEng 2017,
now Investor Relations Analyst at RELX (June 2019)
- Harry Tyler, ‘Statistical Learning from Disaggregated Smart Meter Data’, MEng 2017,
now Investment Management Assistant at NW Brown Group Ltd (June 2019)
- Michael Wilson, ‘A Mathematical Analysis of Disaggregated Smart Meter Data’, BEng 2017,
now Assistant Engineer at JBA Consulting (June 2019)
- Samuel Stradling, ‘Game Theoretic Tools for the Management of Congestion of Energy Networks in the Charging of Electric Vehicles’, MEng 2017,
now Graduate Software Developer at Skycanner (June 2019)
- Adam MacNeil, ‘User strategies for charging electric vehicles’, MEng 2016
now Systems Engineer at Siemens Rail Automation (June 2019)
- Ben Zacaroli, ‘User strategies for charging electric vehicles’, MEng 2016
now Technical Analyst at FlexTrade (June 2019)
- Stefan Kotz, ‘Data Analytics for Personal Energy Consumption’, BEng 2016
now at RWTH Aachen University (Jan 2017)

MSc PROJECT SUPERVISION (MISCADA, Scientific Computing and Data Analysis):

12 MSc research projects since 2020/21, eleven of them with industry partners:

- Benz Preechasiriratna, ‘Which part of the agentic system does the work? A seven-level component analysis of an agentic system for raw NMR processing’, MSc 2026
- Fangyuan Zhao, ‘Advancing Academic Literature Review Generation with Multi-Agent Systems: An AG2-Based, Citation-Aware Framework for Biopharmaceutical Research’, MSc 2025, with CPI’s National Biologics Manufacturing Centre, **now AI Product Manager (Shanghai)** (November 2025)
- Kanghao Zhang, ‘Integrating Multi-Agent Evaluation and Parameter-Efficient Fine-Tuning for Automated Literature Synthesis in Chemical Engineering’, MSc 2025, with CPI’s National Biologics Manufacturing Centre, **now intern at the Bank of Communications (Shanghai)** (November 2025)
- Yunxi Liu, MSc 2025, with CPI’s National Biologics Manufacturing Centre
- Yizhi Fang, MSc 2024, with CPI’s National Biologics Manufacturing Centre
- Stefanos Larkou, MSc 2024, with CPI’s National Biologics Manufacturing Centre
now Software Developer at Synectics Ltd
- Han Lin, MSc 2023, with CPI’s Medicines Manufacturing Innovation Centre (Glasgow)
now Associate Data Analyst with VISA (October 2026)

- Kolotioloma Soro, MSc 2023, with CPI's Medicines Manufacturing Innovation Centre (Glasgow) **now Operations Lead at Glovo** (October 2026)
- Morgan Bugler, MSc 2022, with Calysta, **now PhD student at the University of Southampton** (October 2026)
- Marijn Huis, MSc 2022, with Calysta **now Software Developer at Barclays** (October 2026)
- Peian Lu, MSc 2022, with Calysta
- Qingfei Zhang, MSc 2021, with Calysta

Student awards:

- Samuel Stride, IMechE Best Project Certificate for his MEng project 'Specialised AI Assistants for the Interpretation of Biopharmaceutical Data' (Durham, 2026)
- Tamara Barker-Privalova, third prize for her L1 essay 'Why are there so few women in engineering?' (Durham, 2016)

TEACHING:

- MISCADA MSc AI for Engineering Programme Lead, February 2025–.
- Fellow of the Higher Education Academy (2016).
- Assistant Professor at the Department of Engineering, Durham University:
 - Electrical Engineering 2 (Level 2, ENGI2191): lecturer in System Stability and Control 2015/16–; module leader 2017/18–, coordinating a team of two to four lecturers (252 students in 2026/27).
 - Optimisation (Level 4, MEng and MSc): lecturer 2016/17–; led the optimisation component of Low Carbon Technologies (ENGI4281 and ENGI44120) 2017/18–2019/20; module leader of Optimisation 4 (ENGI4577 and ENGI44C10, later ENGI47615) 2020/21–, redesigned as Optimisation and Control for Artificial Intelligence from 2025/26.
 - Deep Learning for Engineering (MSc Artificial Intelligence for Engineering, ENGI48915): designed the module; module leader 2025/26–.
 - Engineering Practice 1 (Level 1, ENGI1171) 2023/24–.
 - Engineering Design 2 (Level 2, ENGI2201) 2015/16–2021/22.
 - Energy Markets and Risk: eight lectures to Level 4 'Energy Markets, Low Carbon and Thermal Technologies' (ENGI4281) and MSc 'Energy, Markets and Risk' (ENGI43515), Epiphany 2015/16.
 - Led the 2026 redesign of MATH/ENGI1551 (Level 1 Mathematics), first taught at the Wuhan University–Durham University Joint Institute in 2026/27 and in Durham from 2027/28.
- Tutor at the School of Mathematical Sciences, QMUL:
 - MTH773P Advanced Computing in Finance, Spring 2014 (postgraduate module);
 - MTH6142 Complex Networks, Spring 2013;
 - MTH5121 Probability Models, Fall 2012;
 - MTH4102 Differential Equations, Spring 2012;
 - MTH4105 Introduction to Mathematical Computing, Fall 2011;
 - MTH5110 Introduction to Numerical Computing, Spring 2011;
 - MTH4105 Introduction to Mathematical Computing, Fall 2010;
 - MTH4104 Introduction to Algebra, Spring 2010;
 - MTH4105 Introduction to Mathematical Computing, Fall 2009;
 - MTH4102 Differential Equations, Spring 2009.
- Tutor at Instituto Superior Técnico, Lisbon, Portugal:
 - Teaching Assistant in Physics I (2000 Electric Engineering);
 - Teaching Assistant in Computational Physics (1996 and 1997 Physics Engineering);
 - Teaching Assistant in Physics I (1995 Computer Science);

- Teaching Assistant in Physics II (1994 Territory Engineering);
- Teaching Assistant in Classical Mechanics (1991 Mechanics Engineering);
- Teaching Assistant in Experimental Physics I (1991 Physics Engineering).

LANGUAGE PROFICIENCY: Proficiency in Portuguese and English. Fluent communication skills in French and good communication skills in Spanish and Italian.

ALGORITHMIC AND COMPUTATIONAL EXPERIENCE:

- Excellent knowledge of R, Python, and Matlab, and good knowledge of Mathematica. User of Mac OS X, Windows and Linux (Ubuntu);
- I hold a UKRI AI Research Resource allocation on Isambard-AI (2026–).
- I am a user of Durham’s NVIDIA CUDA Centre.