

Innovative applied mathematician with a strong track record in **scientific computation**, with over 15 years' experience working in applied research with a focus on medical interventions. Looking for new challenges in modelling to support medical device development.

- Formulates realistic yet tractable mathematical models, and associated deployable, tested and documented simulations. Excellent **coding** and **software development** skills developed through deployment into clinical and commercial environments, satisfying ISO 13485 standard.
- Communication skills refined through working in multi-disciplinary, international teams at the interface of academic research and industry; lecturing and teaching at universities; delivering invited presentations at international conferences.
- 17 peer-reviewed journal papers (over 250 citations), a book chapter, acquisition of grants (over 500,000€), 12 invited presentations, industrial supervisor to three PhD students, an MSc student, and maintainer of widely used open source code, [k-wave-python](#)

Experience

2019–	Fraunhofer Institute for Digital Medicine MEVIS <i>Senior Research Scientist - Modelling and Simulation Group</i> <ul style="list-style-type: none"> • Developed large-scale simulations for microwave and ultrasound ablative therapies by architecting and parallelizing high-performance numerical methods, enabling clinically relevant treatment planning at scale. • Engineered fast ultrasound beamforming algorithms and a transcranial acoustic/elastic propagation simulator by leveraging GPU-accelerated reconstruction techniques, delivering novel application. 	Bremen, Germany
2014–2019	National Physical Laboratory <i>Senior Research Scientist - Medical Ultrasound Group</i> <ul style="list-style-type: none"> • Established measurement-based simulation for nonlinear propagation through complex media by integrating empirical measurements into computational models, incorporated into IEC technical specification 63587. 	Teddington, United Kingdom
2011–2014	Institute of Cancer Research/The Royal Marsden Hospital <i>Post-Doctoral Research Associate - Therapeutic Ultrasound Group/Joint Department of Physics</i> <ul style="list-style-type: none"> • Developed an ultrasound-guided high-intensity focused ultrasound treatment planning system with a multi-element phased-array by integrating beamforming control, for focal steering and enhanced safety. 	Sutton, United Kingdom
2008–2011	University College London <i>Post-Doctoral Research Associate - Ultrasonics Group/Department of Mechanical Engineering</i> <ul style="list-style-type: none"> • Investigated the influence of cavitation on therapeutic ultrasound by employing numerical and analytical approaches, enabling accurate prediction of cavitation in order to optimize treatment efficacy and safety. 	London, United Kingdom

Education

2004–2008	PhD - Dynamical Systems Thesis: “Integrability, Localisation and Bifurcation of an Elastic Conducting Rod in a Uniform Magnetic Field”, Advisor: Prof. Gert van der Heijden	University College London
2003–2004	MSc - Modern Applications of Mathematics	University of Bath
2000–2003	BSc - Mathematics with Applied Mathematics/Mathematical Physics	Imperial College London

Awards & Esteem Indicators

2020	IEEE IUS Challenge on Ultrasound Beamforming with Deep Learning (CUBDL) Joint first place in IEEE IUS CUBDL Challenge for “Improving image quality of single plane wave ultrasound via deep learning based channel compounding” (2020)	
2015–	International Expert Member IEC/BSI Technical Committee 87 (Ultrasonics), in an individual capacity, associate IMA, full member IOP	
Various	EPSRC Enhanced Scholarships Enhanced funding for MSc (2004), PhD (2008) and post-doctoral work (2014)	

Skills

programming: python, C++, Matlab, OpenCL
version control: git, svn
testing: google test, pytest
build systems: make, cmake, visual studio
computation FEniCS, Comsol

libraries: ITK, VTK, boost, eigen;
CI/CD: github, gitlab
documentation: sphinx, doxygen
presentation: \LaTeX , Bib \TeX , html, css: tailwind, bootstrap
languages: English (native), German (B2.1) with permanent residency