

home: djps.github.io github: [djps](https://github.com/djps) linkedin: [sindendavid](https://www.linkedin.com/in/sindendavid) twitter: [@david_sinden](https://twitter.com/david_sinden) david.sinden@gmail.com

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, internationally recognised expert on ultrasound simulation for therapy and diagnosis. Looking for new challenges in modelling to support medical device development, open to relocation.

- Formulates realistic yet tractable mathematical models, and deployable, tested and documented simulations. Excellent coding and software development skills developed through clinical/commercial deployment, satisfying ISO 13485/IEC 62304 standards.
- 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** Bremen, Germany
Senior Research Scientist - Modelling and Simulation Group
 - 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.
- 2014–2019 **National Physical Laboratory** Teddington, United Kingdom
Senior Research Scientist - Medical Ultrasound Group
 - Established measurement-based simulation for nonlinear propagation through complex media by integrating empirical measurements into computational models, incorporated into IEC technical specification 63587.
- 2011–2014 **Institute of Cancer Research/The Royal Marsden Hospital** Sutton, United Kingdom
Post-Doctoral Research Associate - Therapeutic Ultrasound Group/Joint Department of Physics
 - 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.
- 2008–2011 **University College London** London, United Kingdom
Post-Doctoral Research Associate - Ultrasonics Group/Department of Mechanical Engineering
 - 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.

Education

- 2004–2008 **PhD - Dynamical Systems** University College London
 Thesis: “Integrability, Localisation and Bifurcation of an Elastic Conducting Rod in a Uniform Magnetic Field”
- 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

DevOps: git, svn, github, gitlab, google test, pytest, make, cmake, visual studio

Languages: English (native), German (B2.1) with permanent residency

Libraries: ITK, VTK, boost, eigen

Computation: FEniCS, Comsol