

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 associated deployable, tested and documented simulations. Excellent coding and software development skills developed through clinical/commercial deployment, 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

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| 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

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| 2004–2008 | PhD - Dynamical Systems
Thesis: "Integrability, Localisation and Bifurcation of an Elastic Conducting Rod in a Uniform Magnetic Field" | 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

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| 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