



# David Sinden

home: [djps.github.io](https://djps.github.io)   github: [djps](https://github.com/djps)   linkedin: [sindendavid](https://www.linkedin.com/in/sindendavid)   xing: [david\\_sinden](https://www.xing.com/profile/david_sinden)  
[david.sinden@gmail.com](mailto:david.sinden@gmail.com)  
Bremen, British Citizen with permanent residency in Germany, 27.12.1981

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. Experienced in leading a managing complex interdisciplinary projects, as well as working in a team.
- 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

## Professional Experience

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Nov 2019–

### Fraunhofer-Institut für Digitale Medizin MEVIS

Bremen, Germany

Senior Research Scientist — Modelling & Simulation Group

Skills: python, VTK, ultrasound modelling, treatment planning, software development, elastography, uncertainty analysis

- 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 signal-processing techniques, delivering real-time imaging performance and improved diagnostic accuracy.

Jun 2014–Nov 2019

### National Physical Laboratory

Teddington, United Kingdom

Senior Research Scientist — Ultrasound & Underwater Acoustics Group

Skills: python, matlab, Finite Element Analysis (COMSOL, FeniCS), ultrasound modelling, signal processing

- Established measurement-based simulation for nonlinear propagation through complex media by integrating empirical measurements into high-fidelity nonlinear computational models, enabling accurate predictions and incorporation into the IEC standard 63587.

Jun 2011– Jun 2014

### Institute of Cancer Research/The Royal Marsden Hospital

Sutton, United Kingdom

Post Doctoral Research Associate — Therapeutic Ultrasound Group/Joint Department of Physics

Skills: python, VTK, ultrasound modelling, treatment planning, software development

- Developed an ultrasound-guided high-intensity focused ultrasound treatment planning system with a multi-element phased-array by integrating real-time ultrasonic imaging and adaptive beamforming control, enabling precise focus steering, dynamic treatment adjustments, and enhanced therapy safety.

Jun 2008– Jun 2011

### University College London

London, United Kingdom

Post Doctoral Research Associate — Ultrasound Group/Department of Mechanical Engineering

Skills: mathematical modelling, Fortran, differential equations

- Investigated the influence of cavitation on therapeutic ultrasound by employing numerical simulations and analytical modeling, enabling accurate prediction of cavitation thresholds and optimization of treatment efficacy and safety.

## Education

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2004–2008

### PhD - Dynamical Systems

University College London, United Kingdom

2003–2004

### MSc - Modern Applications of Mathematics

University of Bath, United Kingdom

2000–2003

### BSc - Mathematics with Applied Math./Math. Physics

Imperial College London, United Kingdom

# Auszeichnungen & Wertschätzungsindikatoren

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2020

## **IEEE IUS Challenge on Ultrasound Beamforming with Deep Learning (CUBDL)**

Joint first place in international machine learning challenge applied to ultrasound image reconstruction (2020)

2015-

## **International Expert**

Member IEC/BSI Technical Committee 87 (Ultrasonics), in an individual capacity, associate IMA, full member IOP

Various

## **Enhanced Scholarships**

Enhanced funding for MSc (2004), PhD (2008) and post-doctoral work (2014) from UK funding agency EPSRC

# Skills

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**Programming:** python, C++, Matlab, OpenCL

**Libraries:** ITK, VTK, boost, eigen

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

**Computation:** FEniCS, Comsol

**Languages:** Englisch (Native), Deutsch (B2.1) with permanent residency