

Dr Antonis (Antony) Vamvakeros

Research Engineer / Applied Scientist — Machine Learning for Scientific Data

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Profile

With over a decade of experience in advanced scientific imaging, I specialise in creating machine learning solutions for complex inverse problems. My research unites the development of physics-aware deep learning with high-end experimental research, including cutting-edge *operando* multimodal imaging at large-scale facilities. Seeking a position to establish an independent research group and pursue data-driven research at the interface of machine learning, hyperspectral imaging, and materials characterisation.

Experience

Nov 2022 - present: **Royal Society Industry Fellow, Dyson School of Design Engineering, Imperial**

- Cutting-edge Research: Developed physics-informed and generative AI models (GANs, flow-matching) for unpaired multi-modal multi-resolution imaging data fusion
- Project Founder: Conceived and created the [Battery Imaging Library \(BIL\)](#), the first open-access multi-modal and multi-length-scale imaging database for battery research. I led an international team of [48 researchers](#) from the UK, France, Germany, USA and Japan.
- Supervision: Mentoring a PhD student on [image segmentation](#) using Meta's SAM and Dino foundation models; steered work to successful presentation at NeurIPS 2024 [AI4Mat Workshop](#)

Feb 2021 - present: **Research & Development Lead Scientist, Finden Ltd**

- Team Management: Leading the scientific computing team consisting of three scientists
- Grant & PI Leadership: Technical lead and co-PI for £900k+ in UKRI funded R&D projects
- Software Development: Directed the engineering development of [BeamStop](#), Finden's first commercial software for chemical imaging and tomography data
- Code IP & Licensing: Secured IP licensing for proprietary [PQ-Net](#) neural network code to an OEM and open-source [nDTomo](#) code integrated into the DECTRIS Ltd [cloud platform](#)

May 2017 - Feb 2021: **Research Scientist, Finden Ltd**

- Machine Learning for Industry: Developed computer vision and X-ray CT metal artefact reduction models for a UK government agency
- Experiments for Industry: Performed advanced materials characterisation for industrial clients
- Inhouse R&D: Designed and deployed ML methods for [tomographic reconstruction](#), data denoising, [artefact reduction](#), image segmentation and [fast spectroscopic data analysis](#)

Jan 2019 - Jan 2021: **Honorary Research Fellow, Dept. of Chemistry, UCL**

- Technical Breakthrough: Developed the [Direct Least-Squares Reconstruction](#) algorithm, providing the first solution to the parallax problem in scatter-based CT

May 2017 - Jan 2019: **Postdoctoral Scientist, European Synchrotron Radiation Facilities**

- Innovation: Developed [5D tomographic diffraction imaging](#) and deployed real-time hyperspectral CT reconstruction and analysis tools for facility users during live experiments

Education

2017: **PhD in Dynamic Hyperspectral Tomography (Chemistry)**, University College London, UK

2013: **MSc in Chemical Process Engineering**, University College London (Distinction), UK

2012: **MEng in Chemical Engineering**, University of Patras, Greece

Selected Open-Source Code and Data: [nDTomo](#), [BIL](#), [Vulture](#), [HR-Dv2](#), [SAMBA](#), [SD2I](#)

Awards

- Royal Society of Chemistry 2023 Analytical Science Horizon Prize: "[The XRD-CT Pioneers](#)"
- Clark Prize, Department of Chemistry, UCL (2016)