George Webber

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Second-year PhD student at King's College London with a First-Class Master's in Mathematics & Computer Science from the University of Oxford. Research focuses on integrating generative machine learning models with conventional PET and MR reconstruction techniques to enhance medical image quality.

Education

King's College London *Sept 2023 – Present*
PhD in Biomedical Engineering & Imaging Sciences

- Project: *Fully Bayesian 3D PET-MR Neuroimaging Reconstruction.*
- Investigating pre-trained diffusion models as generative priors for inverse problems in medical imaging.
- Supervisors: Prof. Andrew J. Reader and Prof. Andrew P. King.

St Anne's College, University of Oxford *Oct 2019 – Jun 2023*
MMathCompSci – Mathematics & Computer Science

- First Class overall (77 %) and Distinction in final year (81 %).
- Master's thesis: *Improving the Security of Smartwatch Payment with Deep Learning.*

John Mason School, Abingdon *Sept 2012 – 2019*
A-Levels and EPQ

- A*A*A*A*A* in Mathematics, Further Mathematics, Computer Science, Physics, and an EPQ.

Experience

Graduate Teaching Assistant *London, UK*
King's College London *Nov 2023 – Present*

- Deliver tutorials for undergraduate mathematics and labs for an interdisciplinary medical imaging module.
- Mark coursework and provide detailed feedback to cohorts of 60+ students.

Alpha Tech Intern – Quant Analysis *London, UK*
Man Group *Jun – Sep 2022*

- Designed experiments on simulated portfolios, enhancing Value-at-Risk calculations by incorporating earnings-announcement effects.
- Co-authored an internal research paper and delivered a 30-minute presentation to senior risk managers.
- Shipped production-ready Python code to calculate daily risk metrics.

Senior Consultant *Oxford, UK*
Oxford Strategy Group Digital *Sep – Dec 2021*

- Open-sourced and extended Wise's variational-autoencoder model for customer-behaviour prediction.
- Authored tutorials and Jupyter notebooks demonstrating applications for fintech clients.

Software Engineering Intern *Remote / UK*
Microsoft *Jul – Aug 2021*

- Built and documented an automated monitoring solution for critical infrastructure.
- Acted as technical lead among interns—wrote high-level design docs, test plans, and conducted code reviews.

Publications

Journal Articles

Likelihood-Scheduled Score-Based Generative Modeling for Fully 3-D PET Image Reconstruction G. Webber et al., *IEEE Transactions on Medical Imaging* June 2025
doi:10.1109/TMI.2025.3576483

Diffusion Models for Medical Image Reconstruction Sept 2024

G. Webber & A. J. Reader, *BJR—Artificial Intelligence*

doi:10.1093/bjrai/ubae013

Conference Proceedings

Generative-Model-Based Fully 3-D PET Image Reconstruction by Conditional Diffusion Sampling Nov 2024

G. Webber et al., IEEE Medical Imaging Conference (MIC) 2024, Tampa (oral)

doi:10.1109/NSS/MIC/RTSD57108.2024.10657861

Multi-Subject Image Synthesis as a Generative Prior for Single-Subject PET Reconstruction Nov 2024

G. Webber et al., IEEE MIC 2024, Tampa (poster)

doi:10.1109/NSS/MIC/RTSD57108.2024.10657446

Submitted Manuscripts

Distributional Consistency Loss: Solving Noisy Inverse Problems Without Overfitting Submitted: May 2025

G. Webber & A. J. Reader, *NeurIPS 2025 (under review)*

Steerable Conditional Diffusion for Domain Adaptation in PET Image Reconstruction Submitted: May 2025

G. Webber et al., *IEEE MIC 2025 (under review)*

Supervised Diffusion-Model-Based PET Image Reconstruction Submitted: Feb 2025

G. Webber et al., *MICCAI 2025 (under review)*

Personalized MR-Informed Diffusion Models for 3D PET Image Reconstruction Submitted: Feb 2025

G. Webber et al., *IEEE Transactions on Radiation and Plasma Medical Sciences (under review)*

arXiv:2506.03804

Technologies

Programming: Proficient with Python (NumPy, Pandas, SciPy; PyTorch, TensorFlow, scikit-learn; Matplotlib, Napari). Familiar with Java, C#, Scala, HTML, SQL, JavaScript, CSS, Haskell.

Tools & Workflow: Git / GitHub, Linux & Windows, Azure + GCS storage, Scrum / Agile (Confluence, Jira), LaTeX.

Activities

- Won sponsor prize at **Oxford Hack 2022** for novel LiDAR-data visualisation for Oxa autonomous vehicles.
- Elected **Student Representative** for the Smart Medical Imaging CDT cohort – organise research-development seminars and social events.