Alec Sargood

AI Researcher | PhD Candidate @ UCL

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PROFESSIONAL SUMMARY

Applied Mathematician and PhD Candidate specializing in modern AI methods for image analysis. My work focuses on researching and applying modern generative frameworks, such as Diffusion Models and Flow Matching, as well as Reinforcement Learning (RL) techniques for complex image-to-image synthesis and reconstruction tasks.

TECHNICAL SKILLS

- **Core AI Research:** Generative Models, Probabilistic ML, Reinforcement Learning, Computer Vision, Information Theory.
- **Languages:** Python, Julia, MATLAB, R.
- **Engineering Stack:** PyTorch (Distributed Data Parallel, HPC integration), Numerical Solvers.

EDUCATION

PhD in Computer Science 2023 – Present
University College London, Hawkes Institute

- Developing novel models for image related tasks, such as MRI-to-PET translation and global tractography generation. Current projects utilizing RL-augmented generation frameworks.

MRes in Biotechnology and Engineering 2022 – 2023
University of Cambridge

- Focus on probabilistic machine learning, computer vision, and information theory.

MSc in Mathematical Modelling and Scientific Computing 2020 – 2021
University of Oxford

- Advanced training in PDEs, optimization, dynamical systems, and numerical analysis.

BSc (Hons) in Mathematics 2017 – 2020
University of Exeter

- Specialization in applied and computational mathematics.

SELECTED PUBLICATIONS

GenTract: Generative Global Tractography
Sargood, A., Puglisi, L., Thompson, E., Musolesi, M., Alexander, D.C.
arXiv preprint arXiv:2511.13183 (2025) **[Link]**

Connectomics Informed by Large Language Models
Thompson, E., He, T., Schroder, A., Abdulaal, A., Sargood, A., Soskic, S., Tregidgo, H.F.J., Alexander, D.C.
arXiv preprint arXiv:2511.05383 (2025) **[Link]**

CoCoLIT: ControlNet-Conditioned Latent Image Translation for MRI to Amyloid PET Synthesis
Sargood, A., Puglisi, L., Cole, J.H., Oxtoby, N.P., Ravì, D., Alexander, D.C.
Accepted at the AAAI Conference on Artificial Intelligence (AAAI 2026) **[Link]**

Benchmarking GANs, Diffusion Models, and Flow Matching for T1w-to-T2w MRI Translation
Moschetto, A., Puglisi, L., Sargood, A., Dell'Acqua, P., Guarnera, F., Battiato, S., Ravì, D.
Accepted at CGMMI @ ICIAP2025 **[Link]**

Fixed and Distributed Gene Expression Time Delays in Reaction–Diffusion Systems
Sargood, A., Gaffney, E.A., Krause, A.L.
Bull Math Biol 84, 98 (2022) **[Link]**

PROJECTS & OPEN SOURCE

- **Consistency Models:** Open source implementation of scalable consistency models for the MNIST dataset. (GitHub)

- **CoCoLIT Framework:** 3D Conditional Latent Diffusion Model for image-to-image translation. (GitHub)
- **Reaction–Diffusion Solver:** Developed a high-performance package in MATLAB and Julia for solving stiff PDE systems. (GitHub)

OTHER EXPERIENCE

Mathematics Mentor Oct 2023 – July 2025
Rossetti Academic / King's College School
- Delivered extra-curricular lectures on advanced topics and supervised applied mathematics projects.

Computational Research Assistant Mar 2022 – Mar 2023
University of Cambridge, MRC Cognition and Brain Sciences
- Modeled transcranial ultrasound wave propagation to optimize neuromodulation stimuli.

Undergraduate Researcher (LMS Grant) Summer 2020
London Mathematical Society
- Conducted grant-funded research in computational neuroscience, developing models for neural dynamics.