Snigdha Sen

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SUMMARY

Research Scientist with 5+ years of experience developing deep learning solutions in the healthcare space, primarily for medical imaging applications. Specific interests include multi-modal integration of imaging data, self-supervised learning and deep generative methods. Strong track record of first-author journal publications and conference presentations, as well as international research collaborations.

ACADEMIC BACKGROUND

Ph.D. AI-Enabled Medical Imaging 2021 - 2025
Department of Computer Science, UCL

- Supervised by Dr. Eleftheria Panagiotaki
- Thesis: Non-invasive Tumour Microstructure Estimation with Deep Learning
- Grade: Pass with No Corrections

MRes Medical Imaging 2020 - 2021
Department of Medical Physics and Biomedical Engineering, UCL

- Grade: Distinction + awarded prize for one of the top three theses

MPhys Physics with Theoretical Physics 2016 - 2020
Department of Physics, Imperial College London

- Grade: 2.1

EXPERIENCE

Postdoctoral Research Associate 2025 - Present
UCL

- Working on multi-modal integration of diffusion-weighted MRI data with histopathology and clinical text for robust AI-driven diagnosis of renal tumours
- Building an open-source package to flexibly fit diffusion MRI models with with self-supervised learning for publication in *Computer Methods and Programs in Biomedicine*

Research Scientist Intern 2024
Virdx @ QuantCo

- Conducted a six-month industrial research internship as part of a team developing an AI tool for prostate cancer diagnosis
- Researched and implemented deep-learning-based MRI reconstruction techniques, using convolutional neural networks (CNNs) and generative adversarial networks (GANs)
- Chosen to lead a second project, evaluating the diagnostic performance of the full product pipeline during an MVP sprint
- Enhanced my knowledge of software engineering best practices, up-to-date deep learning methods and product-focused research skills

Postgraduate Teaching Assistant 2021 - Present
University College London

- Teaching assistant for Department of Computer Science Masters modules: Introduction to Machine Learning, AI for Biomedicine and Healthcare and Computational Modelling for Biomedical Imaging

KEY PROJECTS

Deep-Learning-Based Renal Cancer Characterisation 2024 - Present
University College London

- Developed self-supervised deep learning methods to identify novel imaging biomarkers for renal cancer, improving subtype differentiation over current methods
- Designed a deep feature selection method to select optimally informative measurements for image acquisition, reducing scanning time by over 30 minutes
- Journal paper under review at *Radiology: Artificial Intelligence*

Self-Supervised Model Fitting 2022 - 2023
University College London

- Developed a method to fit diffusion MRI computational models to patient data using self-supervised learning, improving parameter estimation accuracy and model generalisability
- Journal paper published in *Magnetic Resonance in Medicine*
- Leading a collaboration to expand this work into an open-source software package with researchers from Cardiff and Utrecht universities
- Expanding to include architectures such as CNNs and variational autoencoders (VAEs)

QuaD22 Challenge, MICCAI: White Matter Focused Diffusion MRI Reconstruction with Deep Learning 2022
University College London

- Co-developed a dual-network approach to identify the most informative subset of a full dataset by progressive subsampling, investigating differences between chronic and episodic migraine patients
- Journal paper published in *Neuroimage Clinical*

SELECTED PUBLICATIONS

1. Sen, S et al. Dual Deep Learning Approach for Non-invasive Renal Tumour Subtyping with VERDICT-MRI *arXiv*, April 2025
2. Sen, S et al. ssVERDICT: Self-Supervised VERDICT-MRI for Enhanced Prostate Tumour Characterisation *Magnetic Resonance in Medicine*, June 2024
3. Sen, S et al. Differentiating False Positive Lesions from Clinically Significant Cancer and Normal Prostate Tissue Using VERDICT MRI and Other Diffusion Models, *Diagnostics*, July 2022

SKILLS

1. Languages: Python, MATLAB
2. Tools: PyTorch, Tensorflow, JAX, ClearML, MLFlow, Git, Docker
3. Techniques: Multi-modal Networks, Self-supervised Learning, GANs, CNNs, VAEs
4. Medical Data: MRI, CT, Ultrasound, Clinical Text, Histopathology, Radiomics

PRESENTATIONS, AWARDS AND ACTIVITIES

1. Invited Talks: Cardiff University 2024, UCL Cancer Symposium 2023
2. ISMRM Trainee (Educational) Stipend recipient 2022, 2023, 2024
3. Lead organiser of a multi-institutional Hackathon in 2022, 2023