

# Snigdha Sen

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Centre for Medical Image Computing - Department of Computer Science - University College London  
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<b>PRINCIPAL INTERESTS</b>	Deep learning; including self-supervised learning. Computational image analysis, computer-aided diagnosis and wider healthcare applications of machine learning.
<b>ACADEMIC BACKGROUND</b>	<div><div><i>Ph.D. AI-Enabled Medical Imaging</i>2021 - Present</div><div>Department of Computer Science, University College London<ul style="list-style-type: none"><li>Supervised by <a href="#">Dr. Laura Panagiotaki</a></li><li>Working thesis title: Noninvasive Microstructural Parameter Estimation with Deep Learning for Prostate Cancer</li></ul></div><div><div><i>MRes Medical Imaging</i>2020 - 2021</div><div>Department of Medical Physics and Biomedical Engineering, University College London<ul style="list-style-type: none"><li>Supervised by <a href="#">Dr. Laura Panagiotaki</a></li><li>Thesis: An Investigation into False Positive Cases of Prostate Cancer using VERDICT-MRI and Deep Learning</li><li>Grade: Distinction</li></ul></div><div><div><i>MPhys Physics with Theoretical Physics</i>2016 - 2020</div><div>Department of Physics, Imperial College London<ul style="list-style-type: none"><li>Supervised by <a href="#">Prof. Kim Christensen</a></li><li>Thesis: A Complexity Science Approach to Epilepsy</li><li>Grade: 2.1</li></ul></div></div></div></div>
<b>PROJECTS</b>	<div><div><i>Self-Supervised Model Fitting</i>2022 - Present</div><div>University College London<ul style="list-style-type: none"><li>Developing methods to fit diffusion MRI signal models to data using self-supervised learning, to improve accuracy of model parameter estimates</li><li>Work accepted to <i>International Symposium on Magnetic Resonance in Medicine (ISMRM)</i> 2023 and submitted to <i>The Medical Image Computing and Computer Aided Interventions Society (MICCAI)</i> 2023</li></ul></div><div><div><i>QuaD22 Challenge, MICCAI: White Matter Focused Diffusion MRI Reconstruction with Deep Learning</i>2022</div><div>University College London<ul style="list-style-type: none"><li>Trained a voxelwise fully connected neural network to learn a subset of a full dataset by progressive subsampling, to investigate differences between chronic and episodic migraine patients</li><li>Work accepted to <i>ISMRM</i> 2023 and submitted to <i>Neuroimage</i></li></ul></div><div><div><i>False Positive Cases of Prostate Cancer on Mp-MRI</i>2021 - 2022</div><div>University College London<ul style="list-style-type: none"><li>Used a voxelwise fully connected neural network to differentiate between healthy tissue, benign prostatic diseases and clinically-significant cancer with a range of diffusion MRI models</li></ul></div></div></div></div>

- Work published in *ISMRM 2023* and *Diagnostics*

*Segmentation of Prostate Ultrasound using CNNs* 2021  
University College London

- Built a U-Net-like neural network to predict a class probability map for binary segmentation of prostate ultrasound images

*A Complexity Science Approach to Epilepsy* 2019 - 2020  
Imperial College London

- Developed a computational model based on graph theory to mimic propagation of signals in the brain, to investigate changes that occur during an epileptic seizure

**EMPLOYMENT HISTORY** *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

*Cloud Infrastructure Intern* 2019  
Macquarie Group

- Member of the infrastructure automation team. Used a variety of DevOps tools such as Ansible, Packer, Bamboo and Git, as well as learning Golang

*Research Intern* 2018  
Durham University

- Created simulations of the beta-amyloid protein (responsible for Alzheimer's disease) using the GROMACS software

**PUBLICATIONS**

1. Snigdha Sen, Vanya Valindria, Paddy J. Slator et al. [Differentiating False Positive Lesions from Clinically Significant Cancer and Normal Prostate Tissue Using VERDICT MRI and Other Diffusion Models](#), *Diagnostics*, July 2022
2. Snigdha Sen, Vanya Valindria, Hayley Pye et al. [VERDICT-MRI Analysis of False Positives in Prostate Mp-MRI](#) *ISMRM*, May 2022

**PRESENTATIONS, AWARDS AND ACTIVITIES**

1. ISMRM Trainee (Educational) Stipend recipient 2022, 2023
2. Instigator and lead organiser of a department-wide Hackathon
3. Organiser of a department-wide Away Day
4. UCL Institute of Healthcare Engineering Symposium 2021: *Analysis of False Positive Diffusion MRI in the Prostate using Computational Modelling and Deep Learning*
5. London Hopper Colloquium 2021: *Non-invasive Cancer Histology using Computational Modelling and Deep Learning*
6. ISMRM Diffusion Day 2021: *VERDICT-MRI Analysis of False Positives in Prostate Mp-MRI*

**SKILLS**

1. Coding languages: Python, MATLAB, C++
2. Python packages: PyTorch, Tensorflow, Scikit-Learn