Soumya Snigdha Kundu

+44-7436-215-187 | Linkedin | G-Scholar | Github | Website | PyTorch-Forums | E-mail | London, United Kingdom

Education

King's College London — London, United Kingdom
Ph.D., Biomedical Engineering and Imaging Science Research — *Oct. 2023 – Oct. 2027 (Expected)*
Advisors: Prof. Tom Vercauteren (Computational) and Dr. Jonathan Shapey (Clinical)
Thesis: Artificial Intelligence-driven Management of Brain Tumours

Queen Mary University of London — London, United Kingdom
M.Sc., Machine Learning for Visual Data Analytics; Grade: Distinction — *Sep. 2022 – Sep. 2023*
Advisors: Prof. Greg Slabaugh (Computational) and Dr. Vineet Batta (Clinical)
Thesis: Unveiling the Localization Advantage in Automated Orthopaedic Identification

SRM Institute of Science and Technology — Chennai, India
B.Tech., Computer Science and Engineering – *Minor:* Cloud Computing; Grade: Distinction — *Jul. 2018 – May. 2022*

Selected Publications

- **S. S. Kundu** and P. Ganesh, "Promptly-Cited: Citation based Prompting via Pseudo-Retrieval-Augmented Generation", in Women in Machine Learning Workshop @ Conference on Neural Information Processing Systems (***NeurIPS***), 2024.
- R. Naidu and **S. S. Kundu**, "Improved variants of Score-CAM via Smoothing and Integrating", in Responsible Computer Vision Workshop @ Conference on Computer Vision and Pattern Recognition (***CVPR***), 2021.
- **S. S. Kundu**, "A Distributed Deep Learning Framework for Federated Big Medical Image Analysis," in IEEE International Conference on Big Data (**Big Data**), 2021.

Reviewing: ICML, NeurIPS, ICLR, AISTAS, ICML-ML4LMS, CaPTion@MICCAI, NeurIPS-WiML, MICCAI-FAIMI, IEEE-ISBI.

Research Experience

University of Oxford — Research Intern — Prof. Bartek Papiez | Fall 2023
- Developed the 1^{st} spinal new bone formation (osteophytes) identification pipeline achieving a 200% increase from baseline precision scores through a custom multi-view post-processing strategy *SegPatch*.
- Aided in the development of *Self-Supervised Learning schemes* for an automated Knee Osteoarthritis Severity Classification model.

TRIUMF-Canada's particle accelerator centre — Research Intern — Prof. Akira Konaka & Dr. Patrick De Perio | Summer 2021
- Collaborated with engineers and physicists at the *Water Cherenkov Machine Learning Group* to design a robust scaling function to facilitate a 70% loss decrease for the reconstruction of energy, position and angles of electrons in a *regression* neural network.

National Institute of Technology — Research Intern — Prof. Debashis Nandi | Winter 2021
- Engineered a compound classification + segmentation pipeline for segmenting multiple sclerosis lesions that outperforms stand-alone backbone networks by 10-12% dice score.

Industry Experience

TCS Research & IIIT-Hyderabad — Research Scientist — Mrs. Ramya Hebbalaguppe & Prof. Ranjitha Prasad | Fall 2024
- Responsible for instituting complete explainablity throughout the NORD-F pipeline by generating class activation maps, and reporting Out-of-domain specific fairness and calibration metrics.
- Devised multiple large-scale ablations to surmount the efficiency of NORD-F and improved the the performance by 5% through the integration of a ConvNeXt based backbone.

Stealth Startup — Founding Engineer — Oct. 2020 – Sept. 2022
- Raised ∼ £50000 for the 1^{st} end-to-end automated system to identify 10 separate orthopaedic implants in plain radiographs, while reducing data requirements by >90% and achieving 98% F1-Score.
- Spearheaded a multi-institutional collaboration involving renowned Orthopaedic Surgeons, gathering valuable insights and perspectives to publish an in-depth systematic review of 50+ papers on automated orthopaedic implant identification.
- Maintained the internal *HPC* and *MLOps* infrastructure along with reviewing monthly software updates of junior members, identifying potential improvements and increasing code performance metrics by an average of 15%.

Open-Source Software & Hackathons/Competitions

Insta-Match — Jan 2024 - Oct 2024
- Proposed novel many-to-many instance matching schemes, extended them to formulate new instance-based losses and devised an extensive evaluation framework to holistically evaluate instance imbalance and multiple instance scenarios in semantic segmentation.
- Entire library is GPU optimised – marking one of the 1^{st} libraries to facilitate faster training and inference times in handling instance imbalance in semantic segmentation.
- Gave a talk on this library for Open-Source Company Voxel51.

Mistral AI London Hackathon (HackUK) — Oct 2024
- Developed the 1^{st} critic based multi-modal co-pilot for literary professionals, enhancing visual storytelling through real-time, context-aware generation of stories, poetry, and visual elements across diverse themes.

Anthropic London Hackathon — Dec 2023
- Built a *Large Language Model* based automated Python debugging tool using a novel Error Analysis Prompting method which mathces the performance of Chain of Thought prompting in just a single iteration, earning recognition as a Top 8 finalist in the Hackathon.

Programming and Software Development

Python, C++ | PyTorch, JAX, NumPy, OpenCV, Docker, Git, Slurm, Bash, LaTeX.

Fellowships, Grants and Awards.

MRC DTP Postgraduate *Studentship* — King's College London || < 2% Selection rate. || ∼ £205000 || 2023 Cohort
BDI Summer *Internship* Programme — University of Oxford || 1 of 4 selected applicants || 2023 Cohort
Summer Research *Internship* Program — IIT - Gandhinagar || < 0.008% Selection rate. || 2023 Cohort
MITACS Globalink Research *Internship* — TRIUMF (UVic) || < 3% Selection rate || 2021 Cohort
UKRI Fast Start: Innovation *Grant* — Co-Applicant || ∼ £50000 || 2022 Cohort
SPIE Medical Imaging'25 — Travel Grant Award || $1000
IEEE ISBI'24 — Best Student Poster Award Finalist. (Top 8 out 717 Acceptances)
IEEE ICETCI'21 *Competition* — 3^{rd} Place (Electronic Substation Detection)

Extra-curriculars

Team India — Futsal (2017) | Team Tamil Nadu (2016) (Nationals Silver Medal) — Futsal