SOURYA SENGUPTA

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Dept. of Electrical and Computer Engineering
University of Illinois Urbana-Champaign

EDUCATION

Electrical and Computer Engineering (Ph.D.) **Fall 2020 -**
University of Illinois Urbana-Champaign (UIUC)

Vision Science and Systems Design Engineering (MS by research) **Fall 2018 - 2020**
University of Waterloo, Canada

Electrical Engineering (BS) **2014 - 2018**
Jadavpur University, Kolkata, India

RESEARCH EXPERIENCE

Graduate Research Assistant ***Computational Imaging Science Lab, UIUC*** **Jan 2021 -**
Towards label-efficient and interpretable computational methods for medical imaging
Advisor: ***Prof. Dr. Mark A. Anastasio*** **- Professor, UIUC**

Graduate Research Assistant, ***University of Waterloo*** **Sept 2018 - Jun 2020**
Deep generative models for retinal image analysis
Advisor: ***Prof. Dr. Vasudevan Lakshminarayanan*** **&** ***Prof. John Zelek*** **- Professor, Univ. of Waterloo**

Charpak Summer Research Fellow, ***ENS PARIS, France*** **June 2017-Aug 2017**
Advisor: ***Prof. Dr. Yves Boubenec*** **- Associate Professor, ENS Paris**

Undergraduate Researcher, ***Jadavpur Unuversity, Kolkata*** **JULY 2016 -June 2017**
Advisor: Prof. Dr. Dipak Ghosh **- Professor Emeritus, Jadavpur University, India**

Research Internship, ***Indian Institute of Technology, Kanpur*** **MAY 2016-JULY 2016**
Advisor: Prof. Dr. Nischal K Verma **- Professor. IIT Kanpur**

RESEARCH INTEREST

Medical Imaging, Label-free imaging, Interpretable Deep Learning

SELECTED PUBLICATIONS (H INDEX = 7)

Journals

1. **Shao, Z*., *S Sengupta**, Li, H., & Anastasio, M. A. (2023). Semi-Supervised Semantic Segmentation of Cell Nuclei via Diffusion-based Large-Scale Pre-Training and Collaborative Learning. *arXiv preprint* (doi: https://arxiv.org/abs/2308.04578)**
2. **M Fanous, *S Sengupta*, S he, M Anastasio, G Popescu *Label-free white blood cell detection, classification and analysis using phase imaging with computational specificity (PICS) Scientific Reports, Nature*, 2022 (doi: https://www.nature.com/articles/s41598-022-21250-z)**

3. *S Sengupta*, A Singh, H Leopold, T Gulati, V Lakshminarayanan *Ophthalmic Diagnosis Using Deep Learning with Fundus Images - A Critical Review* in *Artificial Intelligence in Medicine, Elsevier* (doi: https://doi.org/10.1016/j.artmed.2019.101758)

4. A Singh, *S Sengupta*, V Lakshminarayanan *Explainable deep learning models in medical image analysis.* Journal of Imaging. (doi: https://doi.org/10.3390/jimaging6060052)

Conference

1. *S Sengupta*, & M.A. Anastasio (2023). Revisiting model self-interpretability in a decision-theoretic way for binary medical image classification. arXiv preprint (doi: https://doi.org/10.1117/12.2612614). Accepted in ICML 2023 Workshop Interpretable Machine Learning in Healthcare

2. *S Sengupta*, M. Anastasio *Decision theory-inspired interpretability for deep binary medical image classification networks via reparameterization*, Oral Presentation: Asian Conference on Machine Learning (ACML), Machine Learning for Medical Imaging .

3. A. Saha, *S Sengupta De-speckling of Optical Coherence Tomography Images Using Anscombe Transform and a Noisier2noise Model*, MICCAI 2020 OMIA Workshop.

4. *S Sengupta*, M. Fanous, H. Li, M. Anastasio *Semi-supervised Segmentation, Contrastive Learning, Deep Learning, Quantitative Phase Imaging* Accepted in Proc SPIE Medical Imaging 2023, San Diego (Oral Presentation).

5. *S Sengupta*, C. Abbey, K. Li, M. Anastasio *Investigation of Adversarial Robust Training for Establishing Interpretable CNN-based Numerical Observers* in Proc SPIE Medical Imaging 2022, San Diego. (doi: https://doi.org/10.1117/12.2612614)

6. C. Abbey, *S Sengupta*, M. Anastasio *Analyzing neural networks applied to an anatomical simulation of the breast* in Proc SPIE Medical Imaging 2022, San Diego. (doi: https://doi.org/10.1117/12.2613220)

7. *S Sengupta*, A Singh, V Lakshminarayanan *"EdgeWaveNet: edge aware residual wavelet GAN for OCT image denoising"* SPIE Medical Imaging 2021 (Oral Presentation). (doi: https://doi.org/10.1117/12.2581110)

8. *S Sengupta*, A Wong, A Singh, J Zelek, V Lakshminarayanan *DeSupGAN: Multi-scale Feature Averaging Generative Adversarial Network for Simultaneous De-blurring and Super-Resolution of Retinal Fundus Images*, Oral Presentation: MICCAI 2020 workshop OMIA. (doi: https://doi.org/10.1007/978-3-030-63419-3_4)

9. A Singh,*S Sengupta*, J Zelek, V Lakshminarayanan *What Is the Optimal Attribution Method for Explainable Ophthalmic Disease Classification?*, Oral Presentation: MICCAI 2020 Workshop OMIA (Best Paper Award). (doi: https://doi.org/10.1007/978-3-030-63419-3_3)

10. *S Sengupta*, A Athwale, J Zelek, V Lakshminarayanan *FunSyn-Net: Enhanced Residual Variational Auto-encoder and Image-to-Image Translation Network for Fundus Image Synthesis*, SPIE Medical Imaging 2020, Houston, USA.. (doi: https://doi.org/10.1117/12.2549869)

AWARDS AND ACHIEVEMENTS

NIH T32 Pre-doctoral Traineeship AwardCohort 2021 (Cohort 2021 Webpage)
University of Waterloo Graduate Scholarship for Excellent Academic Performance, UWaterloo,2019
Best Paper Award MICCAI 2020 workshop OMIA
Best Poster Award at Computer Vision and Intelligent Systems (CVIS) conference, University of Waterloo 2019.
SPIE Travel Grant 2019
Indo-France Charpak Summer Research Fellow 2017 (Only 26 students from India were selected)

MENTORSHIP EXPERIENCE

Kara mathias (Uni High School), Anusha Ghosh (UIUC CS 2023), Mariam Vaid (Uni High School), Zhuchen Shao (Tsinghua Uni), Akshaya Athawale (ISM Dhanbad, India)

TECHNOLOGY SKILLS

Python, R, Matlab, ImageJ, C++, Microsoft Office, LaTeX, Keras/Tensorflow, Pytorch, SciPy, Numpy, OpenCV, Scikit-learn, pandas

ACADEMIC SERVICES:

Conference: MICCAI, EMBC
Journal: IEEE Transaction of Medical Imaging, SPIE Journal of Medical Imaging, Elsevier Artificial Intelligence in Medicine, Journal of Electronic Imaging, Nature Scientific Reports.

MEDIA

Cancer Center at Illinois Student Spotlight : Link