

# S. Shailja | Curriculum Vitae

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## Employment

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### Stanford University

*Postdoctoral Fellow, Radiological Sciences Laboratory*  
 Advisor: Dr. Jennifer McNab

July 2024 -

## Education

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### University of California, Santa Barbara (UCSB)

*PhD, Electrical and Computer Engineering*

Advisor: Dr. B. S. Manjunath

Committee: Dr. Scott T. Grafton, Dr. Jefferson W. Chen, Dr. Nina Miolane, and Dr. Shiv Chandrasekaran

Thesis: Reeb graphs for topological connectomics

2018 - 2024

### Indian Institute of Technology (IIT), Kharagpur

*B.Tech. in Instrumentation Engineering, Electrical Engineering Department*

Advisor: Dr. Jayanta Mukhopadhyay

Thesis: Visual Navigation of Mobile Robots

2012 - 2016

## Awards

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- Winner of the **2025 MICCAI Doctoral Consortium**, 28th International Conference on Medical Image Computing and Computer Assisted Intervention, Daejeon, South Korea. In media: [UCSB News](#)
- Winner of the 2024 **Winifred and Louis Lancaster Best Dissertation Award** in the field of Mathematics, Physical Sciences, and Engineering, UCSB. In media: [UCSB Current](#)
- Winner of the **Fiona and Michael Goodchild Graduate Mentoring Award** for impactful undergraduate mentorship and outstanding academic achievements, UCSB. In media: [UCSB GradPost](#)
- Named **iREDEFINE ECE Fellow** (a rising stars in ECE award), sponsored by the National Science Foundation, at the ECE Department Heads Association Annual Conference. In media: [UCSB Convergence](#)
- **Best poster award** at the WMSG, International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Hawaii (2025).
- **Wu Tsai Pathways to Neurosciences Fellow**, Stanford (2024-26).
- Finalist for the Schmidt Science Fellowship, UCSB (2024).
- ECE Dissertation Writing Fellowship for \$10,000, UCSB (2024).
- Travel award recipient for ISMRM 2025, workshop at IPAM 2024, MICCAI 2023, 25, ECEDHA iREDEFINE workshop 2023, MICCAI 2022, workshop at IPAM 2022, and NeurIPS 2021.
- Undergraduate academic scholarship (similar to Dean's Honors List), IIT Kharagpur, 2012-16.

## Publications

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- [1] Bowen Zhang, **Shailja, S.** (equal contributors), et al. "ReeSPOT: Reeb Graph Models Semantic Patterns of Normalcy in Human Trajectories". [27<sup>th</sup> International Conference on Pattern Recognition \(ICPR\), 2024.](#)
- [2] **Shailja, S.**, et al. "AI-based analysis of the shunt treatment in pre- and post-surgery computed tomography brain scans of iNPH patients". [Neurosurgery, 2024.](#)
- [3] **Shailja, S.**, et al. "ReeBundle: a method for topological modeling of white matter pathways". [IEEE Transactions on Medical Imaging, 2023.](#)

- [4] **Shailja, S.**, et al. “A computational geometry approach for modeling neuronal fiber pathways”. [International Conference on Medical Image Computing and Computer Assisted Intervention \(MICCAI\), 2021.](#)
- [5] **Shailja, S.**, et al. “Self-efficacy of high school students after an AI-focused pre-college program: A two year impact study”. [American Society for Engineering Education \(ASEE\) Annual Conference & Exposition, 2025.](#)
- [6] **Shailja, S.**, et al. “Scaffolding AI research projects lowers the mathematical difficulty in teaching AI to high school students”. [American Society for Engineering Education \(ASEE\) Annual Conference & Exposition, 2024.](#)
- [7] **Shailja, S.**, et al. “ReTrace: Topological insight to evaluation of white matter tractography using Reeb graphs”. Highest ranked paper in [CDMRI Workshop at the International Conference on Medical Image Computing and Computer Assisted Intervention \(MICCAI\), 2023.](#)
- [8] Jiang, J., Khan, A., **Shailja, S.**, et al. “Segmentation, Tracking, and Sub-cellular Feature Extraction in 3D Time-Lapse Imagery”. [Nature Scientific Reports, 2023.](#)
- [9] Zhang, A., **Shailja, S.**, et al. “Automatic Detection and Neurotransmitter Prediction of Synapses in Electron Microscopy”. [Biological Imaging, 2022.](#)
- [10] **Shailja, S.**, et al. “Semi supervised segmentation and graph-based tracking of 3D nuclei in time-lapse microscopy”. [International Symposium on Biomedical Imaging \(ISBI\), 2021.](#)
- [11] Kao, P.Y., **Shailja, S.**, et al. “Improving patch-based Convolutional Neural Networks for MRI brain tumor segmentation by leveraging location information”. [Frontiers in Neuroscience, 2020.](#)

## Abstracts

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1. Dai, E., Schneider, M.K., Zhou, X., **Shailja, S.**, Zeineh, M. and McNab, J.A., 2025, July. A multi-dimensional diffusion encoding (MDE) protocol for studying brain microstructure changes in neurodegeneration. In Alzheimer’s Association International Conference. ALZ, Toronto, Canada.
2. **Shailja, S.**, et al. 2025, May. Can tractography predict electrophysiological connectivity? In International Society for Magnetic Resonance in Medicine (ISMRM) & ISMRT Annual Meeting & Exhibition, Hawai’i, USA.

## Teaching & mentoring experience

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- **UCSB Certificate in College and University Teaching (CCUT):** Completed teaching-training and experience to demonstrate superior competence in teaching at the university level. [Teaching portfolio.](#)
- **Teaching Associate (instructor of record):** Designed an interdisciplinary course ([Diagnostic AI](#)) on biomedical image analysis, Summer 2023.
- **Teaching Assistant:** Digital Image Processing, Data Structure and Algorithm, Operating System, Machine Intelligence: An introduction to optimization and machine learning, Introduction to Python
- **Mentoring Roles:** Summer Research Academies - Ayush Garg, Saanvi Kotha; Research Mentorship Program - Kathy Li, Sanjay Adhikesaven, Claire Chen, Zhaozhong Wang; Research Engineering Units (REUs) - Krithika Thanigaivelan (JHU), Vikram Bhagavatula (CMU); Women in Science & Engineering (WiSE) and American Association of University Women (AAUW) - Jeanette Quintero.

## Academic Service

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- **Editor:** Conference proceeding of 15th International Workshop, CDMRI 2024, Held in Conjunction with MICCAI 2024, Marrakesh, Morocco, October 6, 2024. [LNCS, volume 15171](#)
- **Organiser:** Computational Diffusion MRI (CDMRI) Workshop at MICCAI, 2024-present.
- **Reviewer:** Brain Communications (2025), Medical Image Computing and Computer Assisted Intervention (MICCAI 2022, 2023, 2024, 2025), International Journal of Computer Assisted Radiology and Surgery ( IJCARS) 2024, International Conference on Information Processing in Computer-Assisted Interventions (IPCAI) 2024,

Medical Physics Journal 2023, International Workshop on Medical Optical Imaging and Virtual Microscopy Image Analysis (MOVI 2022), MICCAI Student Board EMERGE Workshop 2024.

## Invited Talks

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- Can Tractography Predict Electrophysiological Connectivity? WIN, Oxford University, 2025.
- Multimodal Data Integration and Analytics using BisQue: Neuroimaging, UCSB BisQue Workshop, 2025.
- Spatial sub-trajectory clustering using Reeb graphs, DOLCIT Seminar, Caltech, 2024.
- Does brain connectivity affect the natural language response? Department of Neuroscience, UC Berkeley 2024.
- Topological characterizations of neuronal fibers: How to compare the connectivity of two brains?, Department of Radiology, Stanford University, 2024.