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EDUCATION

Purdue University

PhD. Student, Advisor: Tamal K .Dey

West Lafayette, IN, USA
Aug 2020 –Aug 2022(Expected)

The Ohio State University

PhD Student, GPA: 3.94/4.00

Columbus, OH, USA
Aug 2017 –Jul 2020

- Transferred to Purdue with Prof. Tamal K Dey

Jadavpur University

B.E. in ECE, GPA: 9.51/10.00

Kolkata, India
Aug 2013 –Jul 2017

- Thesis: “FPGA Implementation of Stochastic Circuit”

EXPERIENCE

Purdue University

Graduate Research Assistant

West Lafayette, USA
Aug 2020 - Aug 2022 (Expected)

- Finding Clinically Relevant Proteins from Covid-19 Flow-cytometry Data via Persistent Homology

The Ohio State University

Graduate Research Assistant

Columbus, USA
Aug 2017 - Jul 2020

- Gene-expression classification using persistent cycles
- Denoising with Discrete Morse Theory

Georg-August Universität Göttingen

Summer Intern

Göttingen, Germany
May 2016 - Jul 2016

- Evaluation of Wasmote Cryptography

Jadavpur University

Undergraduate Researcher

Kolkata, India
Aug 2013 - Jul 2017

- FPGA Implementation of Stochastic Circuits

PUBLICATIONS

- [1] T. Dey, S.Mandal, and S.Mukherjee, “Gene expression classification using topology and machine learning”, Accepted in APBC 2021.
- [2] S.Mukherjee and R. Slehta, “Denoising with discrete morse theory”, Submitted to CGI 2021.

TEACHING

- **Teaching Assistant** at The Ohio State University Fall 2018
Java Basics (CSE 1223)
- **Teaching Assistant** at The Ohio State University Spring 2019
Java Basics (CSE 1223)
- **Teaching Assistant** at The Ohio State University Fall 2019
Computer Architecture (CSE 3421)
- **Teaching Assistant** at The Ohio State University Spring 2020
Java Basics (CSE 1223)

SKILLS

- **Machine Learning:** Machine Learning on Graphs, Neural Networks
- **Data Analysis:** Topological Data Analysis, Morse Theory
- **Code:** C++, Python, Matlab
- **Skill Group:** PyTorch, PyTorch-Geometric, Tensorflow, Keras

PROJECTS

- Denoising with Discrete Morse Theory Gene-Expression Data Classification
(Surface Reconstruction ,Persistence Homology, 2020)• (ML,Persistence Homology, 2020)

Denoising a noisy data is a fundamental task in this data-driven world. In this paper we provide a persistence-guided discrete Morse theoretic denoising framework. We then discuss the results applying our framework in the field of surface reconstruction from noisy point samples and also extracting surfaces from noisy 3D grayscale images. Our paper is a synergy between classical surface reconstruction and recent findings of Topological Data Analysis.

Interpretation of high-throughput gene expression data continues to require mathematical tools in data analysis that recognizes the shape of the data in high dimensions. The topology relevant curated data that we obtain provides an improvement in deep learning based supervised classifications. We further show that the representative cycles we compute have an unsupervised inclination towards phenotype labels.

SCHOLARSHIPS AND AWARDS

- OSU CSE Departmental Fellowship 2017–2018
- University Bronze Medal 2017
- DAAD Scholarship 2016

EXTRACURRICULAR ACTIVITIES

- Joint President of Buckeye Bengalis 2019–2020
Enhancing cultural diversity at OSU by introducing a glimpse of Bengali culture.
- Member at Kaleidoscope 2017–Present
Voice actor in this performing arts group
- Member of Science Club at Jadavpur University 2014–2017
Participated and mentored teams in annual robotics competition Jontro-Tontro