Swadesh Jana

swadeshjana@gmail.com swadesh13.github.io Swadesh Jana

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Interests: Deep Learning, Computer Vision, LLMs, Robust ML systems

Education

M.Sc. in Machine Learning, University of Tübingen — Tübingen, Germany
Current GPA: 1.58 — 2023–current

B.E. (with Hons.) in Computer Science and Engineering, Jadavpur University — Kolkata, India
CGPA: 9.4/10 - First Class Distinction with Honours (add. 20 credits) — 2019–2023

Experience

Ellis Institute & Max Plank Institute, IMPRS-IS — Tübingen, Germany
Student Researcher — Dec 2024 –current

- Optimising Chain-of-Thought in LLMs
- Supervisor: Dr. Antonio Orvieto

Mercedes-Benz AG — Sindelfingen, Germany
Working Student in Pattern Recognition Team — Apr 2024 –current

- Working student to train/inference object detection models in self-driving cars

TCS Research and Innovation Labs — Mumbai, India
Research Intern at PERC Lab — May–Oct 2022

- Implemented model compression using lottery ticket hypothesis, channel pruning, and knowledge distillation
- Developed a generic algorithm to input a parent model & user requirements and output optimal inference model

Google Summer of Code at Red Hen Lab — Online
Research Intern — Jun–Aug 2021

- Implemeted hand gesture recognition in videos using OpenPose, CNN, and LSTM. Project link: GSoC page
- Invited to Oxford IMCC online talk: YouTube link. Accepted in a symposium at ISGS, 2022: YouTube link
- Supervisor: Dr. Peter Uhrig

Jadavpur University — Kolkata, India
Undergraduate Student Researcher — 2020–2023

- Conducted research in deep learning and computer vision topics such as image processing, geoinformatics, social network analysis and medical data analysis.

Projects

Check the detailed full list of current projects at https://swadesh13.github.io/projects.html

- **Transformer and Graph-based Prediction of Mechnaism of Action in DTI** — Jun 2023–Jan 2024
  - Worked with multimodal biological data using GNNs and LLM-based protein and molecule encoders for predicting mechanism of action (MoA) in drug-target interactions (DTI). Manuscript under review.
  - Supervisor: Dr. Ujjwal Maulik
- **Rethinking Convolutions: Image Segmentation in Medical images** — Aug 2022–Feb 2023
  - Developed fuzzy atrous convolutional layers for better image segmentation in medical datasets.

  - Paper accepted at IEEE ASPCON 2023 conference. 10.1109/ASPCON59071.2023.10396336
  - Supervisor: Dr. Ujjwal Maulik

- **Air pollution prediction using Spatio Temporal Graph CNN** Oct 2021–Feb 2022
  - Application of Spatio-Temporal Graph-based CNN model for air pollution prediction.
  - Paper published in Technological Forecasting and Social Change (10.1016/j.techfore.2024.123684).
  - Codebase: github.com/Swadesh13/Pollution-STGCN
  - Supervisor: Dr. Sarbani Roy

- **ADDS: Attention-based Detection and Trajectory Prediction in Counter-Drone Systems** Jan 2022
  - Presented concept of Transformer Encoder-Decoder based 2D trajectory prediction of drone in videos at MLDS Conference, 2022. Inspiration from Anticipative Video Transformer.

- **Image Classification & Object Detection on road anomalies dataset** Mar–Sep 2021
  - Two papers on classification and object detection models on a self-annotated collection of road anomaly images.
  - Paper published in Springer MONE (10.1007/s11036-023-02118-6)
  - Supervisor: Dr. Sarbani Roy

- **EQ - Virtual Queue for the new normal** Aug 2020
  - Developed web app backend using Node js and MongoDB for the HCL Better Health Hackathon.
  - Code: github.com/Swadesh13/ShopSafe

Skills

*Order reflects decreasing proficiency

- **Programming:** Python, C/C++, Java
- **ML Frameworks:** PyTorch, TensorFlow, Scikit-Learn
- **Backend:** Node JS, Java Servlets
- **Frontend:** HTML, CSS, Javascript
- **Database:** SQL, MongoDB
- **Other Tools:** Bash, Git, Jupyter, LaTeX
- **OS:** Linux (Ubuntu)

Languages

- **English:** Fluent
- **Bengali:** Native Language
- **Hindi:** Proficient
- **German:** Basic

Achievements

- Selected for the Google Research Week 2023 at Bangalore, India (Jan 29-31, 2023) Jan 2023
- Rank 49 (Top 2%) in SIIM-ISIC Melanoma Classification, 2020 (Kaggle) 2020
- Jagadis Bose National Science Talent Search Senior Scholarship 2019–2023
- Letter of Recognition from West Bengal State for AISSCE 2019 results 2019

Technical Engagement & Leadership

- Mentor at GSoC, Red Hen Lab Jun–Aug 2023
  Mentored 2 students to extend work on hand gesture recognition, leading to successful completion.
- Secretary at DevHub, Jadavpur University Jan 2021–Feb 2022
  Managing a community-based developers group. Session videos available on YouTube.