Swadesh Jana

swadeshjana@gmail.com swadesh13.github.io Google Scholar Linkedin GitHub Kaggle

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

Education

M.Sc. in Machine Learning, Eberhard Karls Universität Tübingen — Tübingen, Germany
Current GPA: 1.46 — Oct 2023–present

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) — Aug 2019–May 2023

Research Experience

Eberhard Karls Universität Tübingen, Autonomous Learning Group &
Max Plank Institute, IMPRS-IS & **Ellis Institute** — Tübingen, Germany
Thesis Student & Student Researcher — Dec 2024–present

- Investigating Chain-of-Thought and self-play reasoning in LLMs.
- Supervisors: Prof. Dr. Georg Martius, Dr. Pavel Kolev, Dr. Antonio Orvieto

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

- Supported data processing and the development of vision-based models in autonomous driving environments.

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

- Implemented model compression using lottery ticket hypothesis, channel pruning, and knowledge distillation.
- Developed a workflow to input a large trained model with user requirements to output optimally pruned model.

Google Summer of Code, Red Hen Lab — Online
Research Intern | Supervisor: Dr. Peter Uhrig — Jun 2021–Aug 2021

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

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

- Conducted research in ML topics such as computer vision, geoinformatics, and medical data analysis.
- Collaborated with researchers, cloud deployment of object detection models, researched on model development.

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 (BERT) protein and molecule encoders for predicting mechanism of action (MoA) in drug-target interactions (DTI). Manuscript under review.
  - Supervisor: Dr. Ujjwal Maulik
- **Improving Lung CT Analysis through Fuzzy Dilated Convolution Attention** — Aug 2022–Feb 2023
  - Developed fuzzy atrous convolutional layers for better image segmentation in medical datasets.

  - Publication: IEEE ASPCON 2023 conference 10.1109/ASPCON59071.2023.10396336.
  - Supervisor: Dr. Ujjwal Maulik

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

- **Image Classification & Object Detection on road anomalies dataset** Mar 2021–Sep 2021
  - Research on classification and object detection models on a self-annotated collection of road anomaly images.
  - Publication: 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

- **Programming:** Python, C/C++, Java
- **ML Frameworks:** PyTorch, TensorFlow, Scikit-Learn
- **Full Stack:** HTML, CSS, Javascript, Node JS
- **Database:** SQL, NoSQL, MongoDB
- **Other Tools:** LaTeX, Linux Bash, Git, Streamlit, Singularity, Docker
- **Other Skills:** Data preprocessing & analysis, Fine-tuning ML models

Languages

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

Achievements

- Secured 8th rank (50 teams) in RL course (Tübingen) competition on a two-player hockey game Feb 2025
- Selected for grant support from AICTE & MoE's Innovation Cell for innovation named "RoADAI" Apr 2024
- Secured 2nd rank (55 teams) in a Deep Learning course (Tübingen) challenge on object detection Jan 2024
- Selected for the Google Research Week 2023 at Bangalore, India (Jan 29-31, 2023) Jan 2023
- Secured 49th rank (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.