Shlok Mehendale

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Education

BITS Pilani (KK Birla Goa Campus) Oct 2022 – present
BE Computer Science, MSc Mathematics (Integrated Dual Degree) CGPA : 8.07 (As of 3rd yr semester-1)
Mathematics : Top 5 in a batch of 80 students

Shanti Niketan Vidyapeeth Aug 2021 – Aug 2022 | India
Class XII (CBSE): 93%

St. Mary's Academy Aug 2019 – Aug 2020 | India
Class X (ICSE): 97.4% (4th in region)

Publications and Preprints

A Radon-Nikodým Perspective on Anomaly Detection: Theory and Implications
Shlok Mehendale, Aditya Challa, Rahul Yedida, Sravan Danda, Santonu Sarkar, Snehanshu Saha
Under review at ACM/IMS Journal of Data Science, 2025

Benchmarking Anomaly Detection Algorithms: Deep Learning and Beyond
Shanay Mehta, Shlok Mehendale*, Nicole Fernandes*, Jyotirmoy Sarkar, Santonu Sarkar, Snehanshu Saha*
Under review at IEEE Transactions on Artificial Intelligence (IEEE TAI)
*= Equal Contribution

Atmospheric Noise Resilient Image Classification: Using a Hybrid Pin-GTSVM
Shlok Mehendale, Jajati Keshari Sahoo, Rajendra Kumar Roul
Under Review at Neural Networks Journal

Bridging the Gap: A Weighted Attention Bottleneck Transformer for Multimodal Fusion and Reconstruction
Shlok Mehendale
Published and presented at University of Toronto ConferenceX'25
Cross-Modal reconstruction, building on Google Research's work on Multimodal Bottleneck Transformer

Projects

Long-Tailed Learning and Quantiles (APPCAIR) May 2024 – present
Supervised by Dr. Snehanshu Saha (Head, APPCAIR, BITS Goa)
- Working at the intersection of anomaly detection, imbalanced learning and OOD Generalization
- Implemented 30 SoTA and classical ML algorithms on 98 datasets ranging across various domains
- Collaborators : Dr. Rahul Yedida (North Carolina State), Dr. Santonu Sarkar (HOD, CSIS BITS Goa), Dr. Aditya Challa and Dr. Sravan Danda (APPCAIR, CSIS BITS Goa)

High Dimensional Quantile Distribution Shift Apr 2025 – present
Supervised by Dr. Sravan Danda and Dr. Aditya Challa (APPCAIR)
- Developing robust statistical tools/DL algorithms that are resilient to quantile-based distribution changes
- Other collaborators and supervisors: Hardik Shah (ETH Zurich)

Fault detection and Identification in IoT sensors Jun 2024 – Oct 2024
Dr. Christer Ahlund, Dr. Karan Mitra, Dr. Saguna (LTU Sweden),
Dr. Neena Goveas (CSIS, BITS Goa)
- Worked with BrickSchema-modeled IoT sensor data to detect and classify faults using ML techniques
- Integrated semantic modeling and real-time data streams for fault monitoring
- Industry oriented project, deployed in Sweden (Ace-cybersafe)

BITSAuto: An Autonomous Vehicle Mar 2024 – Dec 2024
Robotics Lab, BITS Goa
- Part of the founding team under Dr. Neena Goveas, in collaboration with Moon Labs, IISER Bhopal
- A funded project for developing an autonomous vehicle, majorly led the Computer Vision and Perception section
- **Led a team of 28 Computer Science undergraduate students** and made immense progress on the fronts of: Image Segmentation , Point Cloud Mapping , GNSS Localisation , Path Planning and Controls

Confluence of Epidemiological Compartmental Models and Deep Neural Networks Apr 2024 – Aug 2024
BITS Pilani (KK Birla Goa Campus) and Yale University
- Presented to Dr. Abhishek Pandey, Associate Director (CIDMA), Yale University and selected for a summer course on Epidemiological Modeling
- Altered Epi-DNNs paper on Indian Covid-19 data and a novel SEIRD model; also presented at a course offered under Dr. Anushaya Mohapatra, BITS Goa

Project Kratos (A Mars Rover Team) Aug 2023 – Jan 2025
Mars Rover Team, BITS Goa
- Deep Learning based Hand Gesture Recognition Controlled Rover (Individual project): successfully implemented two models, using OpenCV, MediaPipe and a LSTM
- Achieved probabilistic mapping, worked with point cloud data and elevation maps using Zed 2i stereo camera
- Applied Arrow/Cone detection models using YOLO v7
- Setup a Research Collaboration with AGH Space Systems, AGH University of Krakow, Poland

Course Requirement Projects
Shearlet-based X-ray tomography
IMAGraph: Image Manipulation through Adjacency Graphs
Statistical Inferences in Machine Learning

Academic Experience

Teaching Experience
Teaching Assistant (**TAShips**)
- Mathematics-2 (Linear Algebra, Complex Numbers): Semester-2 '23-24, Semester-2 '24-25
- Probability and Statistics: Semester-1 '24-25
  WILP (Coursera).
- Command Line Scripting: Semester-2 '24-25
- Object-oriented Programming: Semester-1 '25-26
- Data Visualization: Semester-2 '25-26 (In Progress)

Summer Internship (**STEM4ALL, California**)
- Created, designed and taught a course on Neural Networks and Deep Learning

Course Mentor (Autonomous Robotics, Summer Term Project)
- Mentored a batch of 100 students, sponsored by Geeks For Geeks

Learning Experience
Student Volunteer (IndoML'24).
- Volunteered and shared my work on Anomaly detection with pioneers in the field of Data Science and ML

8th CVIT Summer School on AI
- Selected for an AI summer school with focus on Computer Vision and Machine Learning

ACM SIGKDD Research Internship Program
- Selected as an IKDD Uplink intern for summer May-July'25

Relevant Courses
- BITS Pilani : Statistical Inference and Applications, Optimization, Measures and Integration, Topology, Functional Analysis, Data Structures and Algorithms, Operations Research

Organizations

Project Kratos (Mars Rover Team) Sep 2023 – Apr 2025
Core Member, Autonomous Subsystem
- Setup a Collaboration with AGH Space Systems, AGH Univeristy, Krakow, Poland
- Worked on Elevation Mapping, Point cloud, Probabilistic Maps and Path planning

Henneth Nov 2024 – Mar 2025
Co-Founder (Technical Head)
- A Stanford startup for creating AI agents targeting replacement of the beta testing phase of the product cycle

Developers Society (DevSoc) Aug 2024 – Mar 2025
Core Member, AI/ML Vertical, BITS Goa
- Lead a project on Quantitative trading
- Created assignments for Society Inductions

PathFinders Jan 2023 – Oct 2023
Founder (Executive Head)
- A not-for-profit organization for mentoring and guidance of upcoming engineering aspirants
- **Lead a team of 6 undergraduates** who touched 28 lives and led them to the finest institutes in India

Department of Photography (DoPy) Nov 2022 – May 2023
Crew Member
- Joined as a first year undergrad, covered major technical events and fests

Awards

UofT AI Research Competition Winner - 1st position (ProjectX)
University Of Toronto, Canada
- Represented university at an international level and lead a team of 4 Computer Science undergrads
- Modified Google Research's Multimodal Bottleneck Transformer (MBT) to create a novel weighted architecture (WABT)
- Participating teams included ETH Zurich, Cornell, CMU, University of Edinburgh, University of Cambridge, etc

NXP AIM Hackathon (National and Regional Winners)
NXP Semiconductors, Time of Sports
- Developed quantised models for sign recognition, traffic light detection and obstacle avoidance using YOLO v8
- Offered internship at NXP Semiconductors

International Rover Challenge '24
Space Robotics Society
- 3rd in Autonomous Mission and 6th Overall, as a part of Project Kratos, The Mars Rover Team

Skills

Technical Languages — Proficient {Python} | Comfortable {C++, Java, MATLAB, HTML, CSS, SQL}

Frameworks/Libraries — Software {Anaconda, Slurm, Github, Docker} | Machine-Learning {PyTorch, JAX, Flax, TensorFlow, Keras, Scikit-Learn, Numpy, Pandas, MatplotLib}