Nihar Sanda

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EDUCATION

Northeastern University - Khoury College of Computer Sciences **2023 - 2025 (Expected)**
MS in Computer Science — GPA: 4/4 *Boston, MA, USA*

Indian Institute of Information Technology, Dharwad **2019 - 2023**
Bachelor of Technology, Computer Science and Engineering *Karnataka, India*

SKILLS

Languages: Python, R, Java, CUDA, C++, C, JavaScript, Typescript, OWL, RDF, HTML, CSS
Libraries: Numpy, PyTorch Matplotlib, Seaborn, Scikit, Pandas, Keras, TensorFlow, Dlib, SciPy, Jax
Technologies: Parallel Programming, RESTful services, Flask, Django, Docker, Jenkins, CI/CD, R Shiny
Database: SQLite, PostgreSQL, MySQL, MS SQL, MongoDB, NoSQL, DynamoDB, Redis.

EXPERIENCE

Vanderbilt University **May 2024 - Present**
Machine Learning Research Intern *Nashville, Tennesse*

- Working on the **Human Activity Tracking** using **Multimodal** Data and **Deep Learning** techniques for **NSF AI Engage Institute** project to map Affect into **Self Regulated Learning** processes in education.
- Developing a **multimodal fusion model** for **emotion recognition in conversation** of collaborative learning environment.
- Optimizing GPU-based training processes in DL architectures for GANs, Emotion Recognition using few-shot learning methods.

Indian Institute of Technology, Bombay **May 2023 – Sep 2023**
Research Associate *Mumbai, India*

- Developed an innovative tutoring system, **"Affect Aware Tutoring System Using Video Bots"**, which includes a learning management system capturing click-stream log data and facial data to predict the **user's affect state** in real-time using an optimized transformer-based deep learning model trained on the DAiSEE dataset for 300 hours.
- Engaged in extensive research on **"Privacy Protection of Student Video Data in Diverse Learning Environments"** exploring innovative approaches to **safeguard student privacy** and confidentiality within various educational settings.

Google Summer of Code, PEcAn Project **2022 and 2023**
Student Intern *Bengaluru, India*

- Developing the **various PEcAn packages** of **data assimilation and meta-analysis** for Carbon and Land data.
- Leveraged **R Shiny** to create a **robust and user-friendly dashboard**, empowering users to generate dynamic **SDA (State Data Assimilation) and forecasting graphs** for various researchers around the world.
- Enhanced the **authentication of the existing REST APIs** by incorporating robust **API Key authentication** and implementing efficient **rate-limiting features**.

PROJECTS

Realtime Person Tracking and Reidentification in Embodied Learning Environment | *Computer Vision* **Jan 2024**

- Created and annotated a **person re-identification** dataset for closed-room environment in a **embodied learning class**.
- Enhanced accuracy by **fine-tuning** pre-trained models **(TriNet, Siamese networks, OSNet)** specific to **closed settings**.
- Integrated Re-ID models with advanced **object detection (YOLOv8)** and **motion tracking (Kalman Filters, Particle Filter, DeepSORT).**

Protein Fold Recognition | *NLP, Transformers, Bio-Informatics* **August 2022**

- Implemented advanced **NLP techniques** to improve protein fold recognition for low similarity baseline datasets such as **DD, EDD, TG, and SCOPe**, encompassing diverse amino acid-based **protein sequences** and their **corresponding folds**.
- Extracted **features** by utilizing evolutionary **PSSM and HMM profiles** of protein sequences, and concatenating them with global **Convolutional** and **Skip Bi-gram features**.
- Implemented **BERT and ESM by Meta transformer-based models** for classification and achieving an impressive accuracy **exceeding 93%** across all datasets, **surpassing the previous 85% accuracy.**

ACHIEVEMENTS AND LEADERSHIP

- Director's Gold Medal for the Best Outgoing Student at IIIT Dharwad for 2023 Batch
- Lead a team to the Grand Finals at Smart India Hackathon 2022 and also won many National Level hackathons
- 2 times Google Summer of Code (2022, 2023) Recipient at PEcAn Project • Reviewer at ICCE and T4E conferences.
- Open Source Contributor for Rucio(CERN), CircuitVerse, PEcAn Project with many accepted PRs.
- Founder and President at Velocity, Web Development Club of IIIT Dharwad

RESEARCH PAPERS AND PUBLICATIONS

- **An Effective Framework for the Prediction of Protein Folds using Natural Language Processing and Evolutionary Features** - IEEE/ACM Transactions on Computational Biology and Bioinformatics
- **Interestingness from COVID-19 Data: Ontology and Transformer-Based Methods** - Proceedings in ACL Anthology
- **Ontology-Based Semantic Data Interestingness Using BERT Models** - Taylor and Francis' Connection Science Journal