Anuj Tambwekar

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Research Interests

Trustworthy and Robust ML, Uncertainty Quantification, Few-Shot Learning
ML for Safety and Healthcare, Explainable AI, Applied Computer Vision

Education

University of Michigan, Ann Arbor, MI
M.S. in Computer Science and Engineering — May 2024 (Expected)
GPA: 4.00/4.00

PES University, Bengaluru, India
B.Tech in Computer Science and Engineering | Specialization: Data Science — May 2021
GPA: 9.43/10.00

Publications

A. Tambwekar, A. Maiya, S. Dhavala and S. Saha, *Estimation and Applications of Quantiles in Deep Binary Classification*, IEEE Transactions on Artificial Intelligence [Link] (Journal, 2022)

A. Tambwekar, K. Agrawal, A. Majee and A. Subramanian, *Few-Shot Batch Incremental Road Object Detection via Detector Fusion*, Proceedings of The IEEE/CVF International Conference on Computer Vision (ICCV) Workshops 2021 [Link] (Oral)

M. Kashyap*, **A. Tambwekar***, K. Manohara, and S. Natarajan, *Speech Denoising without Clean Data : A Noise2Noise Approach*, Proceedings of Interspeech 2021 [Link] (Oral - Joint First Author)

Research Experience

University of Michigan Transportation Research Institute (UMTRI), Ann Arbor, MI
Research Assistant, Biosciences Department — Jan 2023 - Present
Supervisors: Dr. Wenbo Sun, Dr. Arpan Kusari and Dr. Byoung-Keon Daniel Park
Developing ML models to estimate the full-body posture of vehicle occupants using sensor fusion of LIDAR and IR data, without any ground truth annotations.

Intel India, Bengaluru, India
Deep Learning Research Intern, VSG Group — Jan 2021 - May 2021
Supervisor: Dr. Anbumani Subramanian
Developed a new model for few-shot object detection catered towards road-objects that obtained SOTA performance on the India Driving Dataset (ICCVW Paper).
Used this model to expand the India Driving Dataset's novel class count by over 20x.

Work Experience

GPTfu, Mountain View, CA
Engineering Intern — May 2023 - Aug 2023
Supervisor: Dr. Vibhu Mittal

- Created a custom semantic search engine and chatbot powered by Weaviate and GPT 3.5
- Integrated multiple generative AI models such as GPT4 and Midjourney, into a single API

Microsoft, Hyderabad, India
Software Engineer — Jul 2021 - Aug 2022

- Index Quality Team: Analysed massive datasets ($>$ 700 TB) and created techniques to automate the filtration of unwanted spam and junk pages from Bing's search Index. Reduced false positive detections by 30%, and migrated the entire legacy quality assessment pipeline to Azure as a collection of microservices and Logic Apps.
- Ranking Service Platform Team: Worked on the development of a thread-safe, shared-memory LPC library that reduced same-node feature computation latency of Bing's ranking service by 50%. Created a C# library to evaluate the consistency of query results.

Software Engineer Intern May 2020 - July 2020
Re-engineered the ORP application of the Global Talent Acquisition team into a collection of microservices for easy scaling. Added one-click deployment functionality to allow clients to deploy any of these services on their own Azure subscriptions for complete data and cost control.

Teaching Experience

Department of Computer Science and Engineering, University of Michigan, Ann Arbor, MI

Graduate Student Instructor
EECS 492: Introduction to Artificial Intelligence (Fall 2023 & 2022), 341 & 274 students resp.
EECS 448: Human-Centered ML (Winter 2023), 73 students

Department of Computer Science and Engineering, PES University, Bengaluru, India

Student Peer Teacher
UE17CS302: Introduction to Operating Systems (Fall 2019), 5 students

Honors & Awards

2022-23 Outstanding GSI Award, CSE Division, University of Michigan 2023

Dr. CNR Rao Merit Scholarship, PES University 2017-2021
40% tuition scholarship awarded to the top 10% of every department.
Received the award every semester.

Intel Student Developer Award, Intel India 2019
Awarded second place in the Intel Student Developer Contest for the project *End-to-End Open Domain Question Answering*.

Projects

Investigating and Improving the Forward-Forward Algorithm
Group project for EECS 545: Graduate Machine Learning. Investigated the Forward-Forward algorithm and showed that sequentially learning a classifier resulted in better performance while retaining most of the benefits of Forward-Forward. [Poster] [Report] [Code]

Triviabot : An end-to-end open domain question answering voicebot
A project in collaboration with Intel India. Created an end-to-end open domain question answering voicebot, using Mozilla Deepspeech, BERT and the Tacotron TTS models, that doubles as a CPU benchmarking tool. [Code]

Automatic collider deployment
A project in collaboration with Intel India. Developed a tool in Unity for the automatic deployment of colliders on humanoid models for AR and VR applications.

Talks

Estimation and Applications of Quantiles in Deep Binary Classification
Presented at The International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC), October 2021 at UNC Greensboro

Skills

Programming Languages: Python, C++, C, C#, JS, PHP
Machine Learning Libraries: PyTorch, Tensorflow, Scikit-Learn
Cloud Development: Azure (Certified), AWS, Docker
Parallel Computing: MPI, OpenMP