Anshul Tomar

+1 (512)-806-9015 | anshulmanas@gmail.com | decoder746 | anshul-tomar-4bba52169

Education

University of Texas at Austin — *Austin, Texas*
M.S. in Computer Science — *2022-2024*
- **Courses Taken:** Distributed Computing, Advanced Computer Vision, Planning, Search and Reasoning, Advanced Operating Systems, Robot Learning, Algorithms, Intro to Financial Maths
- **Teaching Assistant:** Online Advanced Operating Systems, Differential equations with Linear Algebra

Indian Institute of Technology Bombay — *Mumbai, India*
B.Tech with **Honors** in Computer Science and Engineering, **Minor** in Applied Statistics **GPA: 9.14/10.0** — *2017-2021*
- **Computer Science:** OS, Architecture, Database, Networks, Compilers, Automata Theory, Optimization in ML, Advanced Intelligent and Learning Agents, Medical Image Computing, Advanced ML, Theoretical ML, CV, NLP, Image Processing, Automatic Speech Recognition
- **Mathematics:** Derivative Pricing, Regression Analysis, Statistical Inference, Numerical Analysis, Cryptography

Work Experience

University of Texas at Austin — *Austin, Texas*
Graduate Research Assistant - Prof. Kristen Graumann — *May 2023 - Present*
- Learned to predict the acoustic field and utilized an FMMPlanner for audio-visual navigation in SoundSpaces 2.0 with an SPL of 0.85
- Successfully implemented the policy on a real-world Hello Stretch Robot, achieving a success rate of 58% post sim2real transfer

Microsoft — *Bangalore, India*
Data and Applied Scientist I — *May 2021 - August 2022*
- Worked in the BingAds Trust and Safety team to develop image and multi-modal models (ConvNeXt, CLIP) for checking policy compliance
- Collaborated with the AdsBrain team to achieve 4X inference speeds and used DeepSpeed to improve training efficiency
- Incorporated a 2-tiered pipeline with 4.2% PRAUC gains on Adult Policy and caching to enable the processing of 200 Million images daily
- A/B tested our adult signal for banning excessive skin exposure ads and ran the online model/enforcement using the Cosmos database
- Explored graph-based methods for label propagation and self-supervised learning of text models with the help of smart rules

Microsoft — *Bangalore, India*
Data and Applied Scientist Intern — *May 2020 - July 2020*
- Implemented and parallelized graphSAGE model for Large scale ads-query-user dataset and increased click through rate (CTR) by 1.21%
- Used techniques like external sort, reservoir sampling and FastText node embeddings to process a dataset with 400 million nodes

National University at Singapore — *Singapore*
Summer Research Intern — *May 2019 - July 2019*
- Improved the existing hashing methods present for model counting like the ApproxMC2 using edge isoperimetric inequalities

Research Experience

Robust Optimization for Extreme Classification (XC) Datasets — *IIT Bombay*
Guide: Prof. Ganesh Ramakrishnan, Prof. Soumen Chakrabarti, Prof. Purushottam Kar | *BTP II* — *March 2021 - Dec 2021*
- Proposed a REPTILE like bilevel optimization framework over SiameseXML for improving accuracies on tail labels in XC datasets
- Found a boost of approximately 3.8% in R@100, 1.9% in P@5 over the last decile of labels for the AmazonTitles-131K dataset

Video Summarization using fairness — *IIT Bombay*
Guide: Prof. Ganesh Ramakrishnan | *BTP I* | [arxiv] — *July 2020 - Feb 2021*
- Considered multiple quantitative submodular criteria for characterizing good summaries based on human annotation
- Developed a novel recipe based on pareto optimality and a more efficient greedy algorithm for proportional fairness to automatically generate multiple reference summaries from indirect ground truth.

START data analysis — *IIT Bombay*
Guide: Prof. Sharat Chandran | *RnD Project* | [Paper] — *Jan 2020 - July 2020*
- Gathered data for detecting Autism Spectral Disorder amongst children in the age group of 2-7 years using mobile logs
- Used an ensemble of classical ML algorithms (XGBoost, SVM, logistic classifier) to achieve an accuracy of 78% among the three classes

Multi-Label Adversarial Domain Adaptation (ML-ADA) — *IIT Bombay*
Guide: Prof. Biplab Banerjee | [Code][Paper][Supplementary] — *June 2019 - Nov 2019*
- Applied unsupervised domain adaptation for multi-labeled image datasets which focused on discriminating between different label configurations and ensuring a vast gap between positive and negative labels for a given image using similarity and ranking loss
- Used Wasserstein distance-based domain critics for each label which mitigated the fine-grained domain differences

Key Scholastic Achievements

2018-21 **IIT Bombay**, Teaching Assistant **(TA)** for 3 courses - CS101, Computer Vision, Introduction to Data Science
2020 **Google**, One of the 50 students to attend the **Google Research AI** Summer Camp for the Vision track
2018 **IIT Bombay**, Awarded the **Institute Academic Prize** for exceptional academic performance
2017 **JEE Advanced**, Secured **All India Rank 198** in **IIT JEE-Advanced** out of 220,000 candidates
2016 **IMO**, One of the **top 35** students in India selected for IMOTC, International Mathematics Olympiad Training Camp

Technical Skills

Programming **C/C++, Python**, Java, Bash, Arduino, Racket, Prolog, R, LaTeX , MATLAB, Android Studio, Xcode, Swift
Libraries and others **PyTorch, Tensorflow, Git, SQL,** Spark, OpenCV, Keras, HTML, CSS, JavaScript, Django, Bootstrap, WireShark