Anay Majee

anaymajee.me

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Education

- **The University of Texas at Dallas** — Texas, United States
  PhD in Computer Science; *GPA: **3.71/4.0*** *Aug. 2022 – Present*
- **Vellore Institute of Technology** — Chennai, India
  BTech.in Electrical and Electronics Engineering; *GPA: **9.68/10.0 (Gold Medalist)*** *Jun. 2014 – May. 2018*

Experience

- **Fujitsu Research** — California, United States
  Research Intern *May. 2024 - Aug. 2024*
  - **Tabular Graph-Language Multi-Modal Learning**: Developed a *Foundation Model* towards cross-table generalization in tabular data. We achieve this by minimizing the consistency between graph (learnt from a **Graph Transformer** network) and text (learnt from a BART based **Large Language Model** (LLM) encoder) modalities generated from each record in tabular datasets. This work has been submitted to AAAI'25.
- **CARAML Lab, The University of Texas at Dallas** — Texas, United States
  Research Assistant *Aug. 2022 - Present*
  - **Submodular Combinatorial Representation Learning**: Advised by Prof. Rishabh Iyer towards introducing a paradigm shift in Machine Learning to adopt set-based **Submodular functions as learning objectives** to overcome inter-class bias and intra-class variance (accepted to ICML'24) in **longtail recognition** and **Few-Shot Object Detection** (accepted to ECCV'24), improving performance by upto 7.6% and 5.7% respectively.
  - **Submodular In-Context Learning**: Developed a novel architecture improving **Information Retrieval** performance through **In-Context Learning**, leveraging Submodular Point Processes (SPPs) in LLMs (submitted to EMNLP'24), enforcing quality and diversity among selected embeddings.
- **Microsoft** — Bangalore, India
  Data and Applied Scientist 2 *Mar. 2022 - Aug. 2022*
  - **Dense Information Retrieval in Search Advertising**: Developed an **Entity Centric Large Language Model** to improve identification of products, brands etc. resulting in *12% revenue gain in Search Advertising.* Mentored an intern to develop an evaluation framework to benchmark entity centric language models which is used across 3+ teams in Microsoft Advertising.
- **Intel Technologies** — Bangalore, India
  Applied Research Scientist *May. 2018 - Mar.2022*
  - **Few-Shot Road Object Detection**: Led the development of **Few-Shot Object Detection** (FSOD) and **Few-Shot Incremental Learning** (FSIL) algorithms in ***Pytorch*** for detecting rare or unseen road objects in unconstrained driving environments and collected the first ***Few-Shot India Driving dataset***.
  - **OpenVINO Edge-Inferencing Framework**: Developed an End-to-End ***edge-inferencing*** framework to detect driver behavior in ADAS systems by ***facial landmark detection*** and ***gaze estimation*** using ***Intel OpenVINO*** toolkit.
  - **Student Mentor**: Mentored two interns whose work on Few-Shot Object Detection has been accepted to conferences like ICCV-W'21 and WACV'22.

Notable Publications

- **SMILe: Leveraging Submodular Mutual Information for Robust Few-Shot Object Detection** ECCV 2024
  ***Anay Majee**, Ryan Sharp, Dr. Rishabh K. Iyer* *Jul. 2024*
- **SCoRe: Submodular Combinatorial Representation Learning** ICML 2024
  ***Anay Majee**, Suraj Kothawade , Krishnateja K. , Dr. Rishabh K. Iyer* *May 2024*
- **Attention Guided Cosine Margin for Overcoming Class-Imbalance in FSOD** WACV-W 2022
  *Ashutosh Agarwal, **Anay Majee**, Dr.Anbumani Subramanian and Dr.Chetan Arora* *Jan. 2022*
- **Meta-Guided Metric Learner for Overcoming Class Confusion in FSOD** NeurIPS-W 2021
  ***Anay Majee**, Dr.Anbumani Subramanian and Kshitij Agrawal* *Oct. 2021*

- **Few-Shot Batch Incremental Road Object Detection via Detector Fusion** ICCV-W 2021
  Anuj Tambwekar, Kshitij Agrawal, ***Anay Majee*** *and Dr.Anbumani Subramanian* *Aug. 2021*
- **Few-Shot Learning for Road Object Detection** AAAI-W 2021
  Anay Majee*, Kshitij Agrawal* and Dr.Anbumani Subramanian* *Feb. 2021*
- **Enabling Baytrail GPUs for Deep Learning Inferencing on Embedded Hardware** Intel SWPC 2019
  Anay Majee*, Pankaj Rabha* *Dec. 2019*

Other publications in Computer Science and Electrical Engineering are available on my **Google Scholar** profile.

Patents

- **Virtual Electrical Networks** US Patent Office (USPTO)
  Co-Authors: Dileep Paruchuri, Pranesh SK and Yashasvi Bhargava *Dec. 2020*
  - Virtualization of microgrid infrastructures to perform non-invasive identification of faulty nodes and to achieve load balancing for the conservation of energy resources.
- **IoT Based Industrial Energy Monitoring and Control System** Indian Patent Office
  Dr. Gnana Swathika O.V and Madhav Bhatia *Nov. 2023*
  - Smart Energy monitoring and control infrastructure to collect, analyse and visualize electrical energy utilization data from microgrids to address critical faults without human supervision.

Awards and Recognitions

Division Recognition Award, VSG team, Intel India	One among 45 employees	*2021*
Amur Tiger Re-Identification challenge, ICCV (Pose task)	3rd globally / 10 teams	*2019*
Facebook AI Research Self Supervised Learning Challenge, ICCV	3rd globally / 6 teams	*2019*
Rising Star of the Year, VSG team, Intel India	One among 26 employees	*2019*
Gold Medalist, School of Electrical Engg., VIT University	1^{st} among 800 students	*2018*

Services and Volunteering

- **Reviewer: BMVC'21, WACV'22, ICLR'24, WACV'25** Jul. 2021 - Present
  Virtual
- **Teaching Assistant, CS 4375 and CS 6375: Machine Learning** Fall 2022, Spring 2024
  UT Dallas, Richardson, TX
  Teaching Assistant for the undergraduate Machine Learning Course for a class of 101 students.
- **Speaker, Guest Lecture on - Can Machines See Like Humans?** Nov. 2021
  VIT University, Chennai Campus
  Delivered a guest lecture to undergraduate students on the advancements in computer vision and highlight the importance of interdisciplinary research.
- **Panelist, Ideathon Contest 2021** Nov. 2021
  VIT University, Chennai Campus
  Part of the experts committee to judge multiple shortlisted ideas created by university students in the fields of Healthcare, agriculture and education.
- **Speaker, Technical Leadership Development Session (Asia Pacific)** Aug. 2021
  Intel India
  Delivered a talk on Few-Shot Learning for Detection Less-Occuring Road Objects for Driving Systems.
- **Invited Speaker, EPIC Conference** Feb. 2020
  Vishakhapattanam, India
  Delivered an invited talk on "Learning to Learn" - A Meta-Learning approach to computer vision tasks.

  Training a group of Intel Engineers on key application areas of Deep Learning.
- **Student Mentor, Intel Science and Engineering Fair** May 2019
  New-Delhi, India
  Mentored two student groups, representing team India in ISEF.

Skills

- **Languages**: Python, C++, C
- **Software Frameworks**: PyTorch, OpenCV, kubernetes, docker, HuggingFace
- **Artificial Intelligence Techniques**: Representation Learning, Object Detection, Few-Shot Learning, Federated Learning, Submodular Functions, In-Context Learning