Adwait Deshpande

aoxolotl.github.io | linkedin.com/in/adwait-d

Education

Georgia Institute of Technology   Atlanta, Georgia
Master of Science in Computer Science (Specialization: Machine Learning)   *Aug 2021 – May 2023*

Birla Institute of Technology and Science   Pilani, India
Bachelor of Engineering (Hons.) in Computer Science   *Aug 2011 – Jul 2015*

Industry Experience

Technical Lead, NLP R&D   Jul 2019 – Jul 2021
Reverie Language Technologies   *Bengaluru, India*

NLP projects for challenging low-resource settings
- Designed Transformer-based multilingual Natural Language Understanding system for JioTV voice assistant using token level joint intent and entity recognition model
- Deployed RESTFul multi-model servers on Azure Cloud using Docker containers with Elasticsearch for entity linking (30+ million users served @ <50ms latency)
- Reduced NLU model inference time by 60% with model optimization via distillation and quantization
- Researched and implemented matrix rank reduction techniques for multi-head attention calculation in Transformers to reduce training time by 10%

Computer Vision Engineer / Founding Member   Aug 2016 – Apr 2019
Eternal Robotics Pvt. Ltd. (prev. Endless Robotics)   *Hyderabad, India*

Prototype to MVP for industrial painting robot
- Led team of 3 to develop complete command and control robot software along with multi-protocol communication
- Achieved ∼20% speed up compared to prototype (10x faster than human painter) and <5ms spray cutoff response
- Devised 3D reconstruction technique for accurate wall-corner detection in sparse-feature environments using incremental ICP

Member of Technical Staff, R&D   Jul 2015 – Jul 2016
Tonbo Imaging Pvt. Ltd.   *Bengaluru, India*

Computer Vision R&D for advanced camera systems
- Optimized detection and real-time tracking of multiple objects by improving Normalized Cross Correlation and dynamic background subtraction efficiency (accuracy: 30mrads, ± 1px track deviation)

Research Experience

Graduate Student Researcher   Aug 2022 - Present
BRAINML Lab, Georgia Institute of Technology   *Atlanta, GA*

Advisor: Prof. Anqi Wu
- Designing effective animal behavior representations using self-supervised training with CNN and Transformer models

Machine Learning Intern, Prediction   May 2022 – Aug 2022
Motional AD Inc.   *Pittsburgh, PA*

Prediction Research for Autonomous Vehicles
- Researched and implemented lane-aware motion prediction models based on Transformers for SOTA in map compliance

Publications

Indic-Transformers: An Analysis of Transformer Language Models for Indian Languages
Adwait Deshpande[*], Kushal Jain[*], Kumar Shridhar, Felix Laumann, Ayushman Dash (*Equal Contribution)
Accepted to ML Retrospectives, Surveys & Meta-Analyses at NeurIPS 2020 [Link]

PathTeller: Path-based Trajectory Prediction for Autonomous Driving
Sepideh Afshar, Akshay Bhagat, Nachiket Deo, Titas Chakraborty, Yunming Shao, Balarama Raju Buddharaju, Lu Lu, **Adwait Deshpande**, Christopher Hazard, Akshay Dharmavaram, Henggang Cui
Under Review

Academic Projects

Using Domain Adaptation for Sign Language Translation
Improved gloss to text translation for low-resource ASL by +10 BLEU score over prior state-of-the-art using a novel domain adaptation approach on synthetic and natural data

Distance Metrics in Few-Shot Text Classification
Achieved ∼3% performance improvement by using Manhattan distance for high-dimensional embeddings in prototypical networks (CS 7650 - NLP project)

Relevant Coursework

Natural Language Processing (A), Computer Vision (A), Deep Learning (A), Machine Learning (A)

Skills

Programming Languages: Python, C/C++, Julia, JavaScript
Libraries / Skills: PyTorch, pandas, NumPy, MongoDB, SQL, NLTK, spaCy, Docker