

# ADWAIT DESHPANDE

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Machine Learning Engineer with 5+ years of demonstrated excellence in multilingual NLP, autonomous vehicle prediction and activity recognition. Proven track record in enhancing ML system performance, scaling data processing capabilities and driving cross-functional projects from conception to deployment that impact millions of users.

## PUBLICATIONS

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### BPB: Path-based Trajectory Prediction for Autonomous Driving

Sepideh Afshar, Akshay Bhagat, Nachiket Deo, Titas Chakraborty, Balarama Raju Buddhharaju, **Adwait Deshpande**, Henggang Cui

Accepted to *ICRA 2024* [Link]

### 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]

## EXPERIENCE

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### Research Scientist II

Georgia Institute of Technology

Leading R&D for AI-powered smart homes at AI-CARING (NSF-funded)

- Achieved <10ms latency on real-time GNN-based Human Activity Recognition model using concurrent inference and async preprocessing
- Designed scalable ML development cycle using Metaflow and Ray for orchestrating train and deploy workflows
- Led project on complete ML lifecycle management by designing and implementing protocols for data collection, model training and model deployment

### Machine Learning Intern, Prediction

Motional AD Inc.

Prediction Research for Autonomous Vehicles

- Achieved 2<sup>nd</sup> place in DAC metric (0.9930) on Argoverse dataset by implementing lane-aware motion prediction on spatio-temporal Transformer models
- Expedited model training time by 10% with multi-processed data preprocessing and multi-GPU training using DDP and PyTorch Lightning

### Technical Lead, NLP R&D

Reverie Language Technologies

Project owner for Natural Language Understanding at scale

- Pioneered end-to-end ML R&D for JioTV Voice assistant served to multilingual users at scale
- Boosted performance of Transformer-based NLU system using joint intent and entity recognition by 5% points (F1:94)
- Achieved inference speed-up of  $\approx 2x$  using knowledge distillation and model quantization on BERT language models
- Deployed containerized RESTful micro-services on Azure cloud for scalable online inference using Kubernetes and Docker (30+ million users served @ <50ms latency)
- Successfully managed project lifecycle (scoping, deliverables and milestone planning) with cross-team collaboration and direct engagement with B2B clients

### Computer Vision Engineer / Founding Member

Eternal Robotics Pvt. Ltd. (prev. Endless Robotics)

Prototype to Product for industrial painting robot

- Led Software Engineering team to develop command and control robot software with multi-protocol communication
- Achieved  $\sim 20\%$  speed up compared to prototype (10x faster than human painter) by combining multithreading with real-time processing

### Member of Technical Staff, R&D

Tonbo Imaging Pvt. Ltd.

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,  $\pm 1px$  track deviation at 50Hz)

## RESEARCH EXPERIENCE

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### Graduate Student Researcher

BRAINML Lab, Georgia Institute of Technology

Advisor: Prof. Anqi Wu

- Enhanced unsupervised representations for animal behaviors (MABe dataset) using temporal convolutions and contrastive learning

## EDUCATION

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### Georgia Institute of Technology

Master of Science in Computer Science (Specialization: Machine Learning)

### Birla Institute of Technology and Science

Bachelor of Engineering (Hons.) in Computer Science

Atlanta, Georgia

Pilani, India

## SKILLS

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**Programming Languages:** Python, C/C++, JavaScript

**Libraries / Skills:** PyTorch, pandas, NumPy, spaCy, HuggingFace