Abitha Thankaraj

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EDUCATION

Carnegie Mellon University - School of Computer Science   Pittsburgh, PA
Ph.D. in Computer Science   Sept 2023-
Advisor: Prof. Yonatan Bisk

New York University - Courant Institute of Mathematical Sciences   New York, NY
M.S. in Computer Science   Jan 2021 - Dec 2022
Advisor: Prof. Lerrel Pinto, Second Reader: Prof. Rob Fergus

National Institute of Technology - Calicut   Calicut, India
B.Tech. in Computer Science and Engineering   July 2013 – May 2017
Advisor: Prof. Vinod Pathari

PUBLICATIONS/PREPRINTS

Predicting Future Interactions Improves Safety in Multiturn Settings[*]   2024
A. Thankaraj, F.Tajwar, A.Kumar, Y.Bisk
In preparation

That Sounds Right: Auditory Self-Supervision for Dynamic Robot Manipulation   2023
A. Thankaraj, L. Pinto
Conference on Robot Learning (CoRL), 2023   Project | Paper | Code

Context is Everything: Implicit Identification for Dynamics Adaptation   2022
B. Evans, **A. Thankaraj**, L. Pinto
IEEE International Conference on Robotics and Automation (ICRA), 2022   Project | Paper | Code

RB2: Robotic Manipulation Benchmarking with a Twist   2021
S. Dasari, J. Wang, J. Hong, S. Bahl, **A. Thankaraj**, K. Chahal, et al.
NeurIPS - Datasets and Benchmarks Track, 2021   Project | Paper

Misclassifications: The Missing Link   2017
A. Thankaraj, A. Nair, N. Vasudevan, and V. Pathari
International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2017   Paper

TECHNICAL SKILLS

Programming Languages :	Python, Java, C++, shell scripting, SQL
Frameworks & Tools :	PyTorch, JAX, scipy, numpy, triton, CUDA, slurm, OpenMP, MPI, git
ML Training Tools :	Deepspeed, torch distributed, Jax TPU training
Cloud deployment :	GCP, AWS, Kubernetes, Docker

RESEARCH EXPERIENCE

Graduate Research Assistant | Carnegie Mellon University   Sept 2023 -

- Research focused on multi-modal representation learning and reinforcement learning advised by Prof. Yonatan Bisk
- Studied language model safety in multiturn conversations: Created custom dataset for redteaming and fine-tuned open source language models. Developed method to anticipate future interactions that reduces unsafe outputs while maintaining helpfulness. *(In preparation)*
- Foundation models to improve low level control : Improved imitation learning and offline RL methods for robot policy learning using synthetic data from text-to-image generative models

Graduate Research Assistant | New York University - CILVR Laboratory   May 2021 - May 2023

- Research focused on representation learning and decision making for robotics advised by Prof. Lerrel Pinto.
- Implemented visual imitation policies for bimanual manipulation in simulation.
- Developed low latency teleoperation pipeline using virtual reality (Oculus) based controller to collect demonstrations for bimanual robot (xArm7) setup to train imitation-based policies for robot manipulation

- Developed a self-supervised robotic framework (requiring minimal human intervention) to collect audio-behavior dataset. Modeled dynamic, contact rich manipulation behaviors using self-supervised representation learning methods in audio for supervisory signal. *(Published in CoRL '23)*
- Studied domain adaptation in Reinforcement Learning (RL). Introduced context-based dynamics models to deep RL methods, enabling agents to adapt to changing environment dynamics in simulated continuous control tasks in OpenAI gym and DeepMind control suite.
- Developed a novel method to allow predictive models to adapt to changing environment dynamics. Architected pipeline to evaluate the algorithm on a dynamic sliding task on a UR10 robot. (*Published in ICRA'22*)
- Implemented controllers, pipelines, models to benchmark vision based imitation learning algorithms for robotic manipulation on a XArm7 robot. (*Published in NeurIPS - Benchmarks and Datasets '21*)

Research Assistant | NIT Calicut - Big Data Laboratory   April 2015 - June 2015
- Evaluated the performance of parallelized random forests (CudaRF) used for in-silico screening methods in ligand-based drug discovery.

INDUSTRY EXPERIENCE

Quantitative Engineer/Strategy Associate | Goldman Sachs   May 2017 - Nov 2020
- Developed analytics solutions for firmwide liquidity requirements.
- Used statistical methods to prototype anomaly detection and time series forecasting models for failing transactions and unencumbered securities.
- Built scalable, distributed, low latency data platform for the firm's commercial bank on AWS cloud.
- Designed and implemented bitemporal milestoning component used to milestone all datasets ingested.
- Developed and scaled out business critical data pipelines, low latency APIs, stress-testing, monitoring systems.

Summer Strategy Analyst | Goldman Sachs   May 2016 - Jul 2016
- Developed tools to visualise inefficiencies in linear optimization engine used to move securities between locations.

RELEVANT COURSEWORK

Machine learning, Computer vision, Deep learning, Probabilistic Graphical Models, Advanced Topics in Reinforcement learning, Big Data & ML systems, Natural Language Processing, Deep Learning Systems, Multicore Processors: Architecture & Programming, Math Fundamentals for Robotics

SELECTED HONORS & AWARDS

New York University - Master's Innovation Prize	2022
Awarded for research in robot learning	
Google CSRMP Fellow, Class of 2022	2022
Marcus Hackathon - Runner's up	2018
Crowd sourced loans application using Marcus by Goldman Sachs APIs	
National Talent Search Scholarship	2009 - 2017
Awarded by Govt. of India	

TEACHING EXPERIENCE

PSYCH-UA.46 : Lab in Cognition and Perception, New York University	2021
Teaching Assistant : Developed course materials, assignments, held bi-weekly quizzes and office hours.	
CSCI-GA.2820 : DevOps and Agile Methodologies, New York University	2021
Teaching Assistant : Developed course materials, held office hours and advised student projects.	

PROFESSIONAL SERVICE

Conference reviewer: CoRL - Conference on robot learning	2023 -
Journal reviewer: IEEE Robotics & Automation Letters	2023 -
CMU Pathways to AI Research: Mentoring undergrads in AI research	2023 -
NYU AI Winter School: Mentoring undergrads in AI research	2022 - 2023
Katalyst: Initiated collaboration with NGOs, developed curriculum, conducted tutorials and mentored female STEM majors to secure internships in the tech industry.	2018 - 2020
FOSSCell - NIT Calicut: Organised conferences to promote free & open source source software.	2014-2017