

LAKSHITA DODEJA

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EDUCATION

Brown University

Doctor of Philosophy in Computer Science, **GPA: 4.0/4.0**
Advised by Prof. Stefanie Tellex

Providence, USA

(Aug' 23 –Present)

Georgia Institute of Technology

Masters in Computer Science, **GPA: 4.0/4.0**
Specialization – Computational Perception and Robotics

Atlanta, USA

(Aug' 21 –May'23)

National Institute of Technology (NIT)

B.Tech. (Hons) Computer Science, **GPA: 9.35/10**
Graduated as one of the top 10 students in the department

Kurukshetra, India

(Aug' 14 – May' 18)

PUBLICATIONS

1. "Accelerating Residual Reinforcement Learning with Uncertainty Estimation". **Lakshita Dodeja**, Karl Schmeckpeper, Shivam Vats, Thomas Weng, Stefanie Tellex (*In 2nd Workshop on Out-of-Distribution Generalization in Robotics @ RSS'25*)
2. "Towards the design of user-centric strategy recommendation systems for collaborative Human-AI tasks" **Lakshita Dodeja***, Pradyumna Tambwekar*, Erin Hedlund-Botti, and Matthew Gombolay. (*In International Journal of Human-Computer Studies*) (* denotes equal contribution)
3. "A Computational Interface to Translate Unstructured Commander's Intent into a Machine Readable Specification". Pradyumna Tambwekar, **Lakshita Dodeja**, Nathan Vaska, Wei Xu, Matthew Gombolay (2023). (*In Findings of EMNLP'23*)
4. "Hybrid color image watermarking algorithm based on DSWT-DCT-SVD and Arnold transform." Palak Garg, **Lakshita Dodeja**, Priyanka, Mayank Dave (2019). (*In Advances in signal processing and communication*. Springer, Singapore, 2019. 327-336.)

RESEARCH EXPERIENCE

Graduate Researcher, Advisor : Dr Stefanie Tellex, Brown University

(Aug' 23 –Present)

Online Learning with Stochastic Robot Policies

- Introduced a novel residual reinforcement learning framework to provide corrective actions to robotic manipulation policies facilitating rapid adaptation to environmental changes and task dynamics
- We use uncertainty estimates of the base policy to guide the exploration of residual policy
- Also introduced changes in the Residual RL framework to handle stochastic policies like Diffusion Policy and Gaussian Mixture Base Policy

Graduate Researcher, Advisor : Dr Matthew Gombolay, Georgia Tech

(Aug' 21 – Jul'23)

Studying Human Preferences for specifying strategies

- Lead a user study to understand how humans like to be recommended strategies for solving complex tasks
- This highly comprehensive study spanned across ~100 participants
- Several validated surveys were used to measure the perception of a recommendation system including the System Usability Survey (SUS), the NASA TLX, and the Godspeed Perceived Intelligence survey.
- Additionally, we developed a novel questionnaire for objectively measuring participants' general preference toward a strategy recommendation system.

Extracting Goals and Constraints from Strategy descriptions

- Developed a NLP model to convert unstructured natural language strategies into a format that is understandable by machines for the board game RISK
- Applied various NLP techniques to increase the performance of the model, including augmenting the data using paraphrasing software, adding CLS-tokens for goals, pretraining with synthetically generated data, and using pre-existing language models.
- Our Natural Language Model performed significantly better than Humans in inferring intent ($p < 0.05$)

Undergraduate Researcher, Advisor : Dr Mayank Dave, NIT Kurukshetra

(Aug' 17 – Apr' 18)

Digital Image Watermarking

- Developed a new algorithm for digitally watermarking colored images using Discrete Stationary Wavelet Transform (DSWT), Singular Value Decomposition (SVD), Discrete Cosine Transform (DCT) and Arnold Transform
- Achieved 0.95 as our highest Normalized Correlation (NC) value and the proposed algorithm gave a better Peak Signal to Noise Ratio (PSNR) by 22%
- Published paper "Hybrid Color Image Watermarking Algorithm Based on DSWT-DCT-SVD and Arnold Transform" in **Springer**

Wireless Sensor and Actor Networks

- Simulated an energy-efficient rekeying mechanism for clustered WSN and compared it with Sequence Based Key Management Scheme (SKM)
- Number of links rekeyed dropped by 50% in both multi-hop and single-hop networks
- Energy consumption of key refresh operations also dropped by 34% in single-hop networks and 10% for multi-hop networks

Summer Research Intern, IIT, Hyderabad

(May' 16 - Jul' 16)

- Compared performance of YouTube over MPTCP vs WLAN vs LTE
- Developed an app to estimate the Quality of Experience (QoE) of the user in terms of Mean Opinion Score (MOS) and recorded a 34.4% better MOS than LTE and 20.4% better MOS than WLAN for MPTCP

WORK EXPERIENCE

Graduate Teaching Assistant, Georgia Tech

Atlanta, Georgia

Course – Robot Intelligence and Planning

(Jan'22 – May'22)

- Grading assignments and clearing doubts for a class of 100 students

Amazon Development Centre

Bangalore, India

Amazon Prime Verification Team

Software Development Engineer – II

(Oct'20 – July'21)

Plug and Play Verification

- Developed plug and play widgets for customer segment verification throughout Amazon.
- Designed a generic and reusable flow of providing the verification widgets to the customers

Software Development Engineer – I

(Jun' 18 – Sep'20)

Military Identity Realtime Verification

- Led the development of a real time military identity verification software for veteran day
- Integrated our system with a third party for providing military data and performed various performance and load tests
- Successfully ran a seven-day long campaign registering 500k+ customers

Manual Document Verification

- Conceptualized, designed and developed a process for manual document verification
- Configured secure storage of documents, structured the Data Access Object and built the flow for Customer Service Agents to verify the documents

Student Identity Realtime Verification

- Developed a comprehensive reusable system in java for real-time verification for student identity
- The new system helped reduce illegal signups of prime student program and provided a smooth user experience with reduced average latency of 2 seconds

AWARDS & SCHOLARSHIPS

- Scholarship awarded by College of Computing, Georgia Tech to attend **Grace Hopper Conference** (2022)
- First runner's up at **NIT KKR Hackathon** twice powered by **HackerEarth**, for developing a real time health monitoring system for hospitals and for building a college website for first year students (2018, 2016)
- Secured college rank 3 in **ACM-ICPC** (Inter Collegiate Programming Competition) (2017)
- Awarded the prestigious **KVPY scholarship** by the Indian government to promote STEM education out of 100,000 students across India (2014)

VOLUNTEER WORK

- Served on the DEI committee for Graduate Student Council, Brown University. (2024)
- Reviewer for ICRA, RSS-W (2024)
- PhD Recruitment visit day coordinator for CS department at Brown University (2024)
- Student volunteer for Conference on Robot Learning (CoRL) (2023)

Languages Skills – ROS, Python, R, C, C++, Java, Perl, HTML, Javascript, SQL