Tanmay Ambadkar

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Education

The Pennsylvania State University — University Park, PA
Ph.D. in Computer Science and Engineering — *Jan. 2024 – May 2027 (Expected)*

Experience

The Pennsylvania State University — University Park, PA
Research Assistant — *May 2023 — Present*

- Developing and refining specification-guided frameworks to enhance the reliability, safety, and interpretability of RL agents.
- Designing frameworks to implement Reinforcement Learning agents for optimizing operational costs of grid-integrated district energy systems, achieving a **32% cost reduction**.
- Predicted Autism Spectrum Disorder cases in children using time-series models on Electronic Health Records (EHR) data, preprocessing over 500GB of data with PySpark.

Siemens Technology and Services — Remote
Research and Digitization Automation Intern — *Jan. 2022 — July 2022*

- Owned the end-to-end development of a plug-and-play anomaly detection library using AutoEncoders and Explainable AI, deploying the final model on Databricks and presenting a working demo to project stakeholders.
- Engineered end-to-end forecasting workflows that achieved a **0.98** r^2 **score** on internal benchmarks and built CNN-based models for a major client (Starbucks).

Siemens Technology and Services — Remote
Research and Digitization Automation Intern — *May 2021 — July 2021*

- Optimized the Industrial Predictive Analytics Engine (IPAE) by integrating real-time monitoring tools, reducing pipeline execution time by **30%**.
- Developed a library to forecast building occupancy and energy requirements in conjunction with an RL model for optimizing building setpoints for maximum energy savings, for Dubai Expo 2021.

Publications

Robust Adaptive Multi-Step Predictive Shielding. T. Ambadkar, D. Chudiwal, G. Anderson, and A. Verma. *Accepted Student Abstract at AAAI 2026; Submitted to ICLR 2026.* [Paper] [Project Page]

Preference Conditioned Multi-Objective Reinforcement Learning. T. Ambadkar, S. Panda, S. Kale, A. Verma, and J. Dodge. *Submitted to ICLR 2026.* [Paper] [Project Page]

AutoSpec: Automating the Refinement of Reinforcement Learning Specifications. T. Ambadkar, Djordje Zikelic, and A. Verma. *Submitted to ICLR 2026; Poster at PLDI SRC*, 2024. [Paper] [Poster]

Safer Policies via Affine Representations using Koopman Dynamics. T. Ambadkar, D. Chudiwal, G. Anderson, and A. Verma. *Submitted to AAAI 2026.*

MIXTAPE: Middleware for Interactive XAI with Tree-Based AI Performance Evaluation. T. Ambadkar, H. Moore, S. Panda, et al. *SISO SIMposium*, 2025.

Optimizing Operational Costs in Combined Heat and Power Integrated District Heating Systems. S. Anbarasu, **T. Ambadkar**, R. Adhikari, et al. *SimBuild*, 2024. [Paper]

Deep reinforcement learning approach to predict head movement in 360° videos. T. Ambadkar and P. Mazumdar. *Proc. IS&T Int'l. Symp. on Electronic Imaging*, 2022. [Paper] [Code]

Technical Skills

Programming Languages: Python, PySpark, JavaScript, C++
Frameworks: PyTorch, TensorFlow, Stable-Baselines3, Scikit-learn, Flask
Topics: Reinforcement Learning, AI Safety, Formal Methods, Multi-Objective RL, Time-Series Analysis