Aniruddh G Puranic

Curriculum Vitae

November 2023

University of Southern California,
Los Angeles, CA 90089, USA.
aniruddh-puranic.info
puranic@usc.edu
andyruddh

Education

2024*	Ph.D.	Computer Science	University of Southern California, USA
2018	M.S.	Computer Science (Intelligent Robotics)	University of Southern California, USA
2016	B.E.	Computer Science and Engineering	B.M.S. College of Engineering, India

Academic Research

2019–*Present* **Graduate Research Assistant**, University of Southern California, USA.
- Safe human-robot interaction: Learning-from-Demonstrations with Temporal Logics.
- Probabilistic inference of human behaviors via neuro-symbolic reward functions.
- Inference of explainable performance metrics from human feedback and demonstrations.
- Neuro-symbolic deep reinforcement learning.

Jun 2018–Dec 2018 **Research Volunteer**, USC Keck School of Medicine, USA.
- At the Center for Robotic Simulation and Education (CRSE).
- Developed a tool to estimate the deviation of surgical needle entry/exit points in dry-lab from images obtained from the Da Vinci surgical robot.

Industry Experience

Summer 2022 **Research Intern**, SRI International, Princeton, USA.
- Reinforcement learning methods for continual/lifelong learning in multi-agent systems.

Jan 2019–Jul 2019 **Researcher**, Toyota North America R&D - InfoTech Labs, Mountain View, USA.
- Intelligent Connected Systems division.
- Formal reasoning of edge computing configurations for connected vehicle applications (V2V and V2X).

Spring 2015 **Software Engineering Intern**, SMERGERS Inc., Bangalore, India.
- Developed a user interaction system using Python/Django framework for the initial prototype of *'Sector Watch Feature'* which would provide a lot of insight about the businesses in a sector to the users in real time.

Co-Curricular Activities

- Invited talks: MIT AeroAstro/CSAIL. Galois Inc., CMU, UCSD, UPenn
- Poster and demo program committee member for **HSCC 2023**
- Review Editor for *Frontiers in Robotics and AI: Human-Robot Interaction*
- IEEE Student Member
- Volunteer for 32nd International Conference on Computer-Aided Verification (CAV) 2020

US Patents

Status	*Title*	*Organization*
Issued (2022)	Distributed systems and extracting configurations for edge servers using driving scenario awareness.	Toyota
Pending	Methods and systems for processing traffic data from vehicles.	Toyota
Pending	Extracting temporal specifications of features for functional compatibility and integration with OEMs.	Toyota
Pending	Undisclosed (Submitted 2021)	USC
Pending	Undisclosed (Submitted 2023)	USC

Preprints

1. Puranic, AG, JV Deshmukh, and S Nikolaidis (2023). *Signal Temporal Logic-Guided Apprenticeship Learning*. arXiv: 2311.05084 [cs.RO].

Publications

1. Puranic, AG, JV Deshmukh, and S Nikolaidis (2023). Learning Performance Graphs From Demonstrations via Task-Based Evaluations. *IEEE Robotics and Automation Letters (RA-L); Oral presentation at ICRA 2023*. **8**(1), 336–343.
2. Puranic, A, J Deshmukh, and S Nikolaidis (2021). Learning from Demonstrations using Signal Temporal Logic. In: *Proceedings of the 2020 Conference on Robot Learning (CoRL)*. Vol. 155. Proceedings of Machine Learning Research. PMLR, pp.2228–2242. https://proceedings.mlr.press/v155/puranic21a.html.
3. Puranic, AG, JV Deshmukh, and S Nikolaidis (2021). Learning From Demonstrations Using Signal Temporal Logic in Stochastic and Continuous Domains. *IEEE Robotics and Automation Letters (RA-L); Presentation at IROS 2021*. **6**(4), 6250–6257.
4. Mohammadinejad, S, JV Deshmukh, and AG Puranic (2020). Mining Environment Assumptions for Cyber-Physical System Models. In: *2020 ACM/IEEE 11th International Conference on Cyber-Physical Systems (ICCPS)*, pp.87–97.
5. Mohammadinejad, S, JV Deshmukh, AG Puranic, M Vazquez-Chanlatte, and A Donzé (2020). Interpretable Classification of Time-Series Data Using Efficient Enumerative Techniques. In: *Proceedings of the 23rd International Conference on Hybrid Systems: Computation and Control*. HSCC '20. Sydney, New South Wales, Australia: Association for Computing Machinery. https://doi.org/10.1145/3365365.3382218.
6. Balakrishnan, A, AG Puranic, X Qin, A Dokhanchi, JV Deshmukh, H Ben Amor, and G Fainekos (2019). Specifying and Evaluating Quality Metrics for Vision-based Perception Systems. In: *2019 Design, Automation & Test in Europe Conference & Exhibition (DATE)*, pp.1433–1438.
7. Puranic, AG, K Deepak, and V Umadevi (2016). Vehicle Number Plate Recognition System: A Literature Review and Implementation using Template Matching. *International Journal of Computer Applications* **134**, 12–16.

Posters

1. Puranic, A, J Deshmukh, and S Nikolaidis (2022). Poster Abstract: Learning from Demonstrations with Temporal Logics. In: *25th ACM International Conference on Hybrid Systems: Computation and Control*. HSCC '22. Milan, Italy: Association for Computing Machinery. https://doi.org/10.1145/3501710.3524914.
2. Puranic, A, J Chen*, J Nguyen, J Deshmukh, and A Hung (2019). MP35-04 AUTOMATED EVALUATION OF INSTRUMENT FORCE SENSITIVITY DURING ROBOTIC SUTURING UTILIZING VISION-BASED MACHINE LEARNING. *Journal of Urology* **201**(Supplement 4), e505–e506. eprint: https://www.auajournals.org/doi/pdf/10.1097/01.JU.0000555994.79498.94.

Academic Services

Reviewer

ACM/IEEE International Conference on Human Robot Interaction (HRI)	2024
Learning for Dynamics & Control Conference (L4DC)	2023
IEEE Transactions on Cybernetics (IEEE Trans. Cybern.)	2023
Springer Nature - Autonomous Robots (AURO)	2022, 2023
IEEE Robotics and Automation Lettes (RA-L)	2021, 2022, 2023
IEEE International Conference on Robotics and Automation (ICRA)	2022, 2023
ACM International Conference on Hybrid Systems: Computation and Control (HSCC)	2023
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2021
IEEE Transactions on Intelligent Transportation Systems (T-ITS)	2020
IEEE Transactions on Computers (IEEE Trans. Comput.)	2020

Sub-reviewer

2023	CAV, RSS, AAAI, EAAI
2022	ISRR
2021	ICRA, NeurIPS, DAC, ICCPS
2020	HRI, CDC, CAV, DAC, ICRA
2019	ICCPS, CLOUD

Teaching

Fall 2022	**Teaching Assistant**, CSCI 513: Autonomous Cyber-Physical Systems (Prof. Jyotirmoy Deshmukh).
Fall 2020	**Teaching Assistant**, CSCI 513: Autonomous Cyber-Physical Systems (Prof. Jyotirmoy Deshmukh).
Fall 2018	**Course Producer**, CSCI 445: Introduction to Robotics (Prof. Nora Ayanian).
Spring 2018	**Course Producer**, CSCI 545: Robotics (Prof. Stefan Schaal).