Aniruddh G Puranic

Curriculum Vitae

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Education

2019–	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– **Graduate Research Assistant**, University of Southern California, USA.
- Safe human-robot interaction: Learning-from-Demonstrations with Temporal Logics.
- Probabilistic inference of human behaviors via temporal logic-based reward functions.
- Inference of explainable performance metrics from demonstrations.
- Specification-guided LfD.

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 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.
- Data management via edge computing for connected vehicles.

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.

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).

Co-Curricular Activities

- Review Editor for *Frontiers in Robotics and AI: Human-Robot Interaction*
- Invited talk at **Galois, Inc.** on "Reinforcement Learning from Demonstrations with Temporal Logics"
- IEEE Student Member
- Volunteer for (virtual) 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	USC

Publications

1. Puranic, A. G., J. V. Deshmukh, and S. Nikolaidis (2023). Learning Performance Graphs From Demonstrations via Task-Based Evaluations. *IEEE Robotics and Automation Letters* **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, A. G., J. V. Deshmukh, and S. Nikolaidis (2021). Learning From Demonstrations Using Signal Temporal Logic in Stochastic and Continuous Domains. *IEEE Robotics and Automation Letters (RA-L)* **6**(4), 6250–6257.
4. Mohammadinejad, S., J. V. Deshmukh, and A. G. 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., J. V. Deshmukh, A. G. 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., A. G. Puranic, X. Qin, A. Dokhanchi, J. V. 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, A. G., 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

2023 Learning for Dynamics & Control Conference (L4DC)
2023 IEEE Transactions on Cybernetics (IEEE Trans. Cybern.)
2023 Springer Nature - Autonomous Robots (AURO)
2023 IEEE Robotics and Automation Lettes (RA-L)
2023 IEEE International Conference on Robotics and Automation (ICRA)
2022 Springer Nature - Autonomous Robots (AURO)
2022 IEEE Robotics and Automation Letters (RA-L)
2022 IEEE International Conference on Robotics and Automation (ICRA)
2021 IEEE Robotics and Automation Letters (RA-L)
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
2020 IEEE Transactions on Intelligent Transportation Systems (T-ITS)
2020 IEEE Transactions on Computers (IEEE Trans. Comput.)

Sub-reviewer

2022 ISRR
2021 ICRA, NeurIPS, DAC, ICCPS
2020 HRI, CDC, CAV, DAC, ICRA
2019 ICCPS, CLOUD