UTKARSH SONI

@ usoni1@asu.edu   ☎ +1-480-434-3856   ⚲ Phoenix, AZ, USA   ⚯ usoni1.github.io

EDUCATION

Ph.D. in Computer Science

Arizona State University

📅 Jan 2019 – Present   ⚲ Phoenix, USA

- Working on enabling preference specification and explanation generation in human-in-the-loop reinforcement learning systems. Also worked on generating personalized explanations in multi-user settings. Advised by Dr. Subbarao Kambhampati.
- GPA: 4.0/4.0
- Major courses: Artificial Intelligence, Topics in Reinforcement Learning, Human-aware AI, Social Media Mining, and others

M.S. in Computer Science

Arizona State University

📅 Aug 2016 – June 2018   ⚲ Phoenix, USA

- GPA : 4.0/4.0
- Statistical Machine Learning, Data visualization and others.

Bachelor and Master of Technology in CS

Indian Institute of Information Technology

📅 Aug 2011 – April 2016   ⚲ Gwalior, India

- GPA : 8.36/10.0

RESEARCH EXPERIENCE

Graduate Research Assistant

Arizona State University Yochan lab

📅 Jan 2019 – Present   ⚲ Phoenix, USA

- Developed a framework that generates explanations, in user's vocabulary, for actions taken by a reinforcement learning agent.
- Developed a framework that learns user's vocabulary online. This allows the user to specify their preferences which are incorporate in a reinforcement learning agent.
- Developed a framework that personalizes explanations produced by the robot based on the background knowledge of the user.
- Developed a web interface that lets users explore an agent's policy and produces visual explanations for agent's actions.
- Tech : Python, TensorFlow, PyTorch, Numpy, Pandas, LaTeX.

Graduate Research Assistant

Arizona State University Vader lab

📅 Jan 2017 – April 2018   ⚲ Phoenix, USA

- Created multiple web interfaces for Maricopa Association of Government that allow them to analyze employment data
- Conducted large scale human studies to learn a human's cognitive model that relates the perception of graph properties with graph drawings.
- Tech : Flask, D3.js, Node.js, Gephi

CLASS PROJECTS

- Developed an **RL agent** to assist users by predicting their goals and improve its prediction using inverse reinforcement learning.
- **Cyberbullying detection** by training a hierarchical bi-directional LSTM on combined social and temporal data
- Compared state of-the-art **outlier detection** algorithms. Improved the best one through a visual analytics component.
- **WebMD data analytics** Created a visual dashboard to analyze 5-years of WebMD data. Interface visualized similarity between topics, topics' popularity etc.
- Created a tool that helps students learn programming. Used recommendation algorithms to build curriculum and visualization for progress tracking.

SKILLS

- Python • Java • C++ • Linux bash
- PyTorch • TensorFlow • Keras
- OpenCV • Numpy • Pandas •
- Flask • Javascript • Bootstrap • Git

PUBLICATIONS

- Sreedharan, S., **Soni, U.**, Verma, M., Srivastava, S., & Kambhampati, S. Bridging the Gap: Providing Post-Hoc Symbolic Explanations for Sequential Decision-Making Problems with Inscrutable Representations. *Accepted in **ICLR 2022***; (link).
- **Soni, U.**, Sreedharan, S., Verma, M., Guan, L., Marquez, M. & Kambhampati, S. Towards customizable reinforcement learning agents: Enabling preference specification through online vocabulary expansion. Accepted in **NeurIPS 2022 workshop** on Human in the Loop Learning (link)
- **Soni. U.**, Sreedharan, S., & Kambhampati, S. Not all users are the same: Providing personalized explanations for sequential decision making problems. Accepted in **IROS 2021**; (link).
- Mishra, A., **Soni, U.**, Huang, J., Bryan, C. Why? Why not? When? Visual Explanations of Agent Behavior in Reinforcement Learning. *Accepted in **PacificVis 2022***; (link).
- **Soni, U.**, Lu, Y., Hansen, B., Purchase, H. C., Kobourov, S., & Maciejewski, R. The perception of graph properties in graph layouts. Accepted in **EuroVis 2018**. ; (link).
- Gopalakrishnan, S., **Soni, U.,** & Kambhampati, S. Feature-directed Active Learning for Learning User Preferences. *International Workshop of Explainable AI Planning **ICAPS 2019*** ; (link).