UTKARSH SONI

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SUMMARY

A Ph.D. student with research interests in human aware Artificial intelligence. Specifically, I work on personalizing the interaction between an AI agent and the user. This involves personalizing the explanation the agent provides for its actions, and allowing a user to specify their preferences for some sequential decision making task (like reinforcement learning).

EDUCATION

Arizona State University *Aug 2018 - Present*
Doctor of Philosophy (PhD) *Current GPA: 4/4*
Major: Computer Science *Expected Graduation: May, 2024*

Arizona State University *Aug 2016 - June 2018*
Master of Science, Computer Science (MS CS) *GPA: 4/4*
Major: Computer Science

International Institute of Information Technology - Gwalior *August 2011 - April 2016*
Bachelor and Master of Technology. CGPA: 8.36/10
Major: Information Technology

COURSES TAKEN

Artificial Intelligence, Statistical Machine Learning, Topics in Reinforcement Learning, Data Mining, Data Visualisation, Fundamentals of Statistical Learning, Social Media Mining, Distributed Databases and others.

TECHNICAL STRENGTHS

Languages	Python, R, C, C++, MySQL, Java
Web Technologies	D3.js, JavaScript, JSON, NodeJS, HTML, CSS, Flask
Machine Learning Frameworks	Scikit-Learn, Tensorflow, PyTorch, Pandas
Tools	Tableau, Gephi, MATLAB, Git

RESEARCH

- **Soni. U.**, Sreedharan, S., Kambhampati, S. Not all users are the same: Providing personalized explanations for sequential decision making problems. Accepted in *IEEE/RSJ International Conference on Intelligent Robots and Systems* ***IROS 2021***; **(link)**.
- 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)**.
- 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)**.
- Chen, H., **Soni, U.**, Lu, Y., Huroyan, V., Maciejewski, R., Kobourov, S. Same stats, different graphs: Exploring the space of graphs in terms of graph properties. *IEEE transactions on visualization and computer graphics* ***TVCG 2019***. ; **(link)**.

- Gopalakrishnan, S., **Soni, U.,** Thai, T., Lymperopoulos, P., Scheutz, M., Kambhampati, S. (2021). Integrating Planning, Execution and Monitoring in the presence of Open World Novelties: Case Study of an Open World Monopoly Solver. *Workshop on Integrated Planning, Acting, and Execution* ***ICAPS 2021***. ; **(link)**.

- Gopalakrishnan, S., **Soni, U.,** Kambhampati, S. Feature-directed Active Learning for Learning User Preferences. *International Workshop of Explainable AI Planning* ***ICAPS 2019*** ; **(link)**.

WORK EXPERIENCE

ASU Yochan Lab - *Research Assistant* *Jan 2019 - Present*
Advisor: Dr. Subbarao Kambhampati

- Developed a technique for providing personalized explanations to the user for robot's decisions in sequential decision making problems. The technique first learns all the possible user-types, and then frames the interaction between the human and the robot as a partially observable markov decision process with user type as latent variable.
- Developed a technique that can compute explanations for decisions taken by a reinforcement learning agent by creating a local symbolic approximation of the task.
- Currently working on an interface that helps build a symbolic middle layer between a human and a deep learning based reinforcement learning agent to allow a human to communicate their preferences for the agent's policy.

ASU Vader Lab - *Research Assistant* *Jan 2017 - April 2018*
Advisor: Dr. Ross Maciejewski and Dr. Shade Shutters

- Conducted large scale user studies to model how humans perceive different network properties (like graph density or clusters) depending on the automatic graph layout algorithm that is used. In particular, I empirically showed that the difference between two graph property value that the human would notice is proportional to the value of the property.
- Worked on a urban employment tool with technologies like Python Flask, JavaScript and D3. Created multiple websites for government decisions makers that help them analyze multiple aspects of employment data in their region.

ASU- *Graduate Teaching Assistant* *Aug 2018 - Dec 2018*

- Teaching assistant for a graduate level data visualization course.