Sriram Gopalakrishnan

✉ marirsg@gmail.com

AI/ML Researcher, Engineer, and Manager Specializing in Integrating Generative and Classical AI Techniques with Effective Human-in-the-loop Interaction. Experienced in blending insights from cognitive science and psychology to improve Human-in-the-loop integration in algorithms and computational pipelines.

Education

Arizona State University   **Tempe, AZ**
Ph.D. Computer Science   *December 2022*
"Incorporating Human Cognitive Limitations Into Sequential Decision Making Problems and Algorithms"
G.P.A.: 4.0

Lehigh University   **Bethlehem, PA**
M.Sc. Computer Science with Thesis   *May 2017*
"Learning Hierarchical Task Networks Using Semantic Word Embeddings"
G.P.A.: 4.0

Lafayette College   **Easton, PA**
B.Sc. Electrical Engineering, B.A. in Computer Science   *May 2010*
G.P.A.: 3.72

SPECIALIZATIONS AND SKILLS

- Human-AI Interaction Modeling, Reinforcement Learning, Search and Optimization, Automated Planning, Natural Language Processing, Neural Networks.

- Completed CITI certification for responsible research. Conducted human subject experiments for Human-Aware-AI research.

- Programming Languages: Python, C++, C, Java, JavaScript
  ML packages: Pytorch, SciPy, SciKit-Learn, NLTK, and related packages.

- Knowledgeable about, and implemented code with design patterns for complex software projects.

- Has managed development with on and off shore teams, as well as cross-team engineering development. Has managed and mentored interns and new employees.

WORK EXPERIENCE

- **AI Research Lead** - **AI Research Team (JP Morgan & Chase)**
  February 2024 - current

  - Optimizing company operations processes with Information Retrieval and LLMs; Has also applied principles from explainable AI and human computer interaction for improving the user experience. Has put code in production.

  - Co-developed and put into production a tool to help optimize the scheduling of tasks with a

simple user-interface for non-technical users to add/update compliance procedure and team constraints without touching code.

- Has done research on combining LLMs and automated planners for travel planning.

- Has managed interns and employees, for both research and product development

○ **AI Research Senior Associate - AI Research Team (JP Morgan & Chase)**
August 2022 - February 2024

- Did research on constrained time series generation and retrieval that combined diffusion models and non-convex optimization. Research yielded 2 conference publications including a best industry paper award.

- Worked on safer algorithmic recourse. This research work with my intern yielded a conference publication.

- Developed tool to allow user to specify a model of domain dynamics and generate synthetic data. Helpful for problems with sparse data.

○ **AI Research Summer Associate (intern) - AI Research Team (JP Morgan & Chase)**
May - August 2021

- Worked on algorithms for intelligently assigning and prioritizing tasks for human teams. Research yielded a conference publication. This work incorporated human factors into the algorithm to account for human limitations in context (task) switching.

○ **AI Research Summer Associate (intern) - AI Research Team (JP Morgan & Chase)**
June - August 2020

- Worked on the goal recognition problem for detecting client (financial) goals to offer better services. Presented work at a workshop on Finance and Planning.

○ **Graduate Research Associate - Yochan Lab (Arizona State University)**
August 2017 - May 2022

- Researched human-aware-AI in the context of sequential decision making.

- Dissertation topic "Incorporating Human Cognitive Limitations Into Sequential Decision Making Problems and Algorithms".

○ **Graduate Research Associate - Insyte Lab (Lehigh University)**
August 2015 - May 2017

- Researched learning Hierarchical Task Networks (HTN) from action traces using clustering and action embeddings (thesis work)

○ **Design and Development Engineer (Lutron Electronics)**
January 2012 - August 2015

- Helped coordinate the embedded engineering team for a large-scale smart lighting and HVAC control system for home and commercial building automation.

- Improved upon software architecture. Co-designed and Implemented a new communication protocol for the system. This work yielded a patent.

- Mentored new employees.
- Represented the company at tradeshows, and conducted training classes for customers (installers).

○ **Project Embedded Electrical Engineer (Lutron Electronics)**
June 2010 - December 2012

- Developed new features for a lighting control system, running on a 32-bit microcontroller.
- Used design patterns to write robust code. Designed comprehensive test case scenarios for verification.
- Worked with the manufacturing team to troubleshoots production and hardware issues.
- Helped coordinate the offshore development team for embedded software.
- Supervised interns.

PUBLICATIONS

○ Wu, H., Sharma, S., Patra, S., & Gopalakrishnan, S. SafeAR: Towards Safer Algorithmic Recourse by Risk-Aware Policies. In the proceedings of the AAAI conference on Artificial Intelligence (AAAI). 2024.
Outcome of a research internship that I mentored
Oral Presentation (one of only 2% of accepted papers)

○ Coletta, A., Gopalakrishnan, S., Borrajo, D., & Vyetrenko, S. On the constrained time-series generation problem. In the proceedings of the Conference on Neural Information Processing Systems (NeurIPS). 2023.

○ Bamford, T*., Coletta, A.*, Fons, E.*, Gopalakrishnan, S*., Vyetrenko, S., Balch, T., & Veloso, M. Multi-Modal Financial Time-Series Retrieval Through Latent Space Projections. In the proceedings of the International Conference on AI in Finance (ICAIF). 2023.
* Equal contribution
Winner of the Best Industry Paper Award at ICAIF 2023

○ Patra, S., Mahfouz, M., Gopalakrishnan, S., Magazzeni, D., Veloso, M. FinRDDL: Can AI Planning be used for Quantitative Finance Problems?. In the workshop on Planning for Financial Services (FinPlan) at the International Conference on Automated Planning and Scheduling (ICAPS). 2023.

○ Thai, T., Verma, M., Soni, U., Gopalakrishnan, S., Shen, M., Garg, M., ... & Scheutz, M. Methods and Mechanisms for Interactive Novelty Handling in Adversarial Environments. In the Proceedings of the 23rd International Conference on Autonomous Agents and MultiAgent Systems (AAMAS). 2023.

○ Taitler, A., Gimelfarb, Jeong, J., M., Gopalakrishnan, S., Mladenov, M., Liu, X., & Sanner, S. pyRDDLGym: From RDDL to Gym Environments. In the workshop on Planning and Reinforcement Learning (PRL) at the International Conference on Automated Planning and Scheduling (ICAPS). 2023.

○ Gopalakrishnan, S., & Borrajo, D. Assignment and Prioritization Of Tasks With Uncertain Durations For Satisfying Makespans In Decentralized Execution. In the Proceedings of the 32nd International Conference on Automated Planning and Scheduling (ICAPS). 2022.

- Gopalakrishnan, S., & Kambhampati, S. Minimizing Robot Navigation-Graph For Position-Based Predictability By Humans. In the Proceedings of the 22nd International Conference on Autonomous Agents and MultiAgent Systems (AAMAS). 2022.

- Gopalakrishnan, S., Verma,S., & Kambhampati, S. Synthesizing Policies That Account For Human Execution Errors Caused By StateAliasing In Markov Decision Processes. In the workshop on Explainable AI in Planning (XAIP) at the International Conference on Automated Planning and Scheduling (ICAPS). 2021.

- Gopalakrishnan, S., Soni, U., Thai, T., Lymperopoulos, P., Scheutz, M., & Kambhampati, S. Integrating Planning, Execution and Monitoring in the presence of Open World Novelties: Case Study of an Open World Monopoly Solver. In the workshop on Integrating Planning and Execution at the International Conference on Automated Planning and Scheduling (ICAPS). (The associated AI agent was the top performer in the DARPA SAIL-ON program for the monopoly domain). 2021.

- Gopalakrishnan, S., Cohen, L., Koenig, S., & Kumar, T. S. Embedding Directed Graphs in Potential Fields Using FastMap-D. In Thirteenth Annual Symposium on Combinatorial Search (SOCS). 2020.

- Borrajo, D., Gopalakrishnan, S., & Potluru, V. Goal Recognition via Model-based and Model-free Techniques. In the workshop on Planning for Financial Services (FinPlan) at the International Conference on Automated Planning and Scheduling (ICAPS). 2020.

- Gopalakrishnan, S.,Soni, U. & Kambhampati, S. Feature Directed Active Learning. In the Workshop on Explainable AI in Planning at the International Conference on Automated Planning and Scheduling (ICAPS). 2019.

- Gopalakrishnan, S., & Kambhampati, S. TGE-viz: Transition Graph Embedding for Visualization of Plan Traces and Domains. Extended abstract and system demonstrated at the International Conference on Automated Planning and Scheduling (ICAPS). 2019.

- Zha, Y., Li, Y., Gopalakrishnan, S., Li, B., & Kambhampati, S. Recognizing Plans by Learning Embeddings from Observed Action Distributions. In the Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS). 2018.

- Gopalakrishnan, S., Muñoz-Avila, H., & Kuter, U. Learning Task Hierarchies Using Statistical Semantics and Goal Reasoning (Journal Version). AI Communications journal. 2018.

- Nguyen, C., Reifsnyder, N., Gopalakrishnan, S., & Munoz-Avila, H. Automated Learning of Hierarchical Task Networks for Controlling Minecraft Agents. In the 2017 IEEE Conference on Computational Intelligence and Games (CIG). 2017.

- Gopalakrishnan, S., Munoz-Avila, H., & Kuter, U. Word2HTN: Learning Task Hierarchies Using Statistical Semantics and Goal Reasoning. In the 4th Workshop on Goal Reasoning at the International Joint Conferences on Artificial Intelligence (IJCAI). 2016.

PROFESSIONAL SERVICE

- Reviewer for International Conference on Automated Planning and Scheduling (ICAPS). 2024.

- ○ Reviewer for *Artificial Intelligence Journal (AIJ)* (Elsevier). 2023.

- ○ Program committee member for Explainable AI workshop at IJCAI conference (XAI@IJCAI). 2023.

- ○ Reviewer for the Workshop on International Workshop on Human-Aware and Explainable Planning (HAXP) at the International Conference on Automated Planning and Scheduling (ICAPS). 2023.

- ○ Reviewer for Workshop on Open-Domain Reasoning Under Multi-Modal Settings at the Conference on Computer Vision and Pattern Recognition (CVPR). 2023.

- ○ Reviewer for Scientific Reports Journal (Nature/Springer). 2022.

- ○ Reviewer for the International Conference on Robotics and Automation (ICRA). 2022.

- ○ Reviewer for the Workshop on Explainable AI in Planning (XAIP), at the International Conference on Automated Planning and Scheduling (ICAPS). 2022.

- ○ Reviewer for the Workshop on Explainable AI in Planning (XAIP), at the International Conference on Automated Planning and Scheduling (ICAPS). 2021.

- ○ Panelist at NYC techweek event discussing implications of AI in Finance. 2023.

PATENTS

Granted Patents

- ○ **Digital messages in a load control system**. 2015.

    - https://patents.google.com/patent/US20150295411A1/en

- ○ **Load Control system responsive to location of an occupant and mobile devices**. 2016.

    - https://patents.google.com/patent/WO2016029165A2/ko

Filed Patents

- ○ **Method and System for Assignment and Prioritization of Tasks for Decentralized Execution**. 2023.

    - Application No.: 18/118,529

- ○ **Method and System for Multi-Modal Time-Series Retrieval Through Latent Space Projections**. 2023.

    - Application No.: 18/527,945

- ○ **Method and System for Constrained Time Series Generation**. 2023.

    - Application No.: 18/368,365