Sriram Gopalakrishnan

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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-Aware and Explainable AI, Reinforcement Learning, Automated Planning.

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

○ Programming Languages: Python, C++, C, Java, JavaScript
ML libraries: Pytorch, TensorFlow, Planners for PDDL language, SciPy, SciKit-Learn, NLTK, Hugging Face, Ray.

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

○ Extensive experience with Microcontroller/Embedded applications, both hardware and software. Programmed large scale distributed systems for smart lighting and HVAC control; included sensor networks, distributed intelligence, and fail-safes for robust behavior for use in human-occupied spaces. Hold two patents for associated work.

PUBLICATIONS

○ 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.
Winner of the Best Industry Paper Award at ICAIF 2023

○ Wu, H., Sharma, S., Patra, S., & Gopalakrishnan, S. SafeAR: Towards Safer Algorithmic Recourse

by Risk-Aware Policies. In the workshop on Explainable AI in Finance at the International Conference on AI in Finance (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.

WORK EXPERIENCE

- **AI Research Associate Senior (full time)** - **AI Research Team (JP Morgan & Chase)**
  August 2022 - Current

  - Worked on constrained time series generation and retrieval. Research yielded 2 conference publications.
  - Developed tool to allow one to easily specify a model of domain dynamics and generate synthetic data. Helpful for data augmentation or for problems with sparse data.

- **AI Research Summer Associate** - **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** - **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 ICAPS workshop on Finance and Planning (FinPlan) 2020.

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

  - Did research on 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

  - Did research on learning Hierarchical Task Networks (HTN) from action traces using clustering and action embeddings.

- **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.

- **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.

PROFESSIONAL SERVICE

- 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 (2023) discussing AI in Finance.

PATENTS

○ **Digital messages in a load control system**

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

○ **Load Control system responsive to location of an occupant and mobile devices:**

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

REFERENCES

○ Dr. Subbarao Kambhampati (Computer Science professor and Ph.D. research advisor)
rao@asu.edu

○ Dr. Satish Kumar Thittamaranahalli (Research Collaborator, Assistant Professor at University of Southern California)
tkskwork@gmail.com / thittama@usc.edu

○ Dr. Héctor Muñoz-Avila (Master's Thesis Advisor, Professor at Lehigh University)
hem4@lehigh.edu

○ Dr. Daniel Borrajo (Executive Director at J.P. Morgan & Chase - AI Research)
daniel.borrajo@jpmchase.com