

# Sachin Grover

<https://sachingrover211.github.io>

<https://scholar.google.com/citations?user=GLdNdm0AAAAJ>

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Tempe, AZ, USA

## PROFESSIONAL EXPERIENCE

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- Post-Doctoral Researcher** Prof. Heni Ben Amor  
*Interactive Robotics Lab, ASU* October 2024 – Present
  - Working on LLM as Brain to predict parameters of Q-tables and linear policies and evaluating with Open AI gymnasium RL benchmarks.
- Research Scientist, SRI, PARC** August 2022 – June 2024  
*Palo Alto, CA, USA*
  - Created a prototype of an embodied LLM agent to translate requests in natural language into formal representation of PDDL and generate a symbolic plan.
  - Created an end-to-end pipeline for training a medium-sized GPT. Evaluated various fine-tuning techniques for formal PDDL translation.
  - Created LLM-based function calling demos for carbon capture using StreamLit API.
  - Won and collaborated on DARPA EMHAT, to design evaluation methods for digital twins and AI agent teaming based on LLMs. Developing the system for Pandemic, a multi-agent collaborative game.
  - Collaborated on DARPA SAIL-ON, to design and develop Open-world agent capable of handling external and dynamic changes in the environment during execution.
  - Collaborated on DARPA KMASS (Knowledge Management at Speed and Scale) to develop a dynamic knowledge base for 20,000 documents and design update methods to scale to millions of documents.
  - Worked on industrial partnership with Panasonic to evaluate smart factory designs for their production plants.
- Applied Scientist Intern, Amazon** Mentor: Ross McGowan  
*Alexa NLP team, Pittsburgh, USA* May 2021 – August 2021
  - Improve end-to-end Spoken Language Understanding model accuracy using domain knowledge of tokens, intents and slots through embeddings learned using graph based methods such as GCNs for Alexa.
  - Showed upto 2% relative improvement compared to baseline model for internal Amazon dataset.
- Applied Scientist Intern, Amazon** Mentor: Grant Strimel  
*Alexa NLP team, Pittsburgh, USA* May 2018 – August 2018
  - Design post processing techniques for language model quantization and compression.
  - Implemented an optimization model to decrease the memory footprint by 25% without effecting accuracy.
  - Patent** – Compression of machine learned models. (Feb. 2020) US NonProvisional Patent Appl. No. 16/355,338.
- Research Assistant** Advisor: Prof. Subbarao Khambampati  
*Yochan Lab, Arizona State University* October 2016 – July 2022
  - Understand the effects of Human-in-the-loop scenarios on current AI techniques. Design seamless interaction techniques for cooperation between human and robotic agents.
  - Languages used:** Python
- Research Assistant** Advisor: Prof. Kurt VanLehn  
*Dragoon Lab, Arizona State University* January 2014 – May 2018
  - Developed TopoMath, an Intelligent Tutoring System, used to teach arithmetic to high-school students.
  - Developed Dragoon, an Intelligent Tutoring System, which teaches students to model dynamic systems.
  - Modeled student's knowledge to evaluate their learning while interacting with Dragoon.
  - Languages used:** JavaScript (Dojo framework based on AMD), PHP and MySQL.

## RELEVANT PROJECTS

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- Empirically evaluating fine-tuning techniques for large language models** Prof. Ludwig Schmidt  
*DataComp Team* August 2024 – Present
  - Empirically evaluate data generation techniques and the impact of post-training on downstream tasks.
  - Reconstructed Mammoth, WebInstruct and OpenHermes data generation techniques, with LLama3 as the baseline model. Currently, writing the end-to-end pipeline for evaluation.
- Large Language Models as Agents** Self Advised  
*Tempe, AZ* July 2024 – Present
  - Designing an agent with LLM for planning complex tasks, and provide guarantees about plan accuracy using PDDL based planning techniques with language models.
  - Currently evaluating on recent state-of-the-art planning challenges – TravelPlanner and NaturalPlan dataset.

## TECHNICAL SKILLS

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- **Relevant Programming Languages:** JAVA(J2EE & J2SE), PHP, Python, JavaScript (Dojo using AMD), HTML, CSS, MySQL,  $\text{\LaTeX}$ , Matlab, R, C and C++
- **Frameworks:** Pytorch (Intermediate), HuggingFace(Familiar), Tensorflow (Familiar).
- **APIs:** NumPy, SciPy, Pandas, Scikit-learn, FastAPI, StreamLit, XGBoost, Matplotlib, Pillow, OpenCV.

## EDUCATION

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- **Arizona State University, Tempe** Advisor: Prof. Subbarao Kambhampati  
• *Ph.D. in Computer Science & Engineering* Completed July 2022
- **Arizona State University, Tempe** Advisor: Prof. Kurt VanLehn  
• *Master of Science in Computer Science & Engineering* Completed December 2015

## SELECTED PUBLICATIONS & PATENTS

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- **Grover, S.**, Mohan, S. (2024), A Demonstration of Natural Language Understanding in Embodied Planning Agents using LLMs. ICAPS Demonstrations.
- Piotrowski, W., Chao, J., **Grover, S.**, Stern, R., Mohan, S., Douglas, J. (2024). Open World Adaptation in High Fidelity Simulated Environment. ICAPS Demonstrations.
- Piotrowski, W., **Grover, S.**, Perez, A. (2024). Nyx: Domain Independent PDDL+ planner for Classic Control Problems. ICAPS, KEPS workshop. Also submitted to KR conference.
- Piotrowski, W., Stern, R., **Grover, S.**, Mohan, S. (2024). Self-monitoring Adaptive AI Agents Operating in Open Worlds. AAAI Spring Symposium on User-Aligned Assessment of Adaptive AI Systems.
- Mohan, S., Piotrowski, W., Stern, R., **Grover, S.**, Kim, S., Le, J., Sher, Y., de Kleer, J. (2023). A Framework for Agents Operating in Open, Mixed Discrete-Continuous Worlds. AI Journal, Special track on open worlds in AI Journal.
- Piotrowski, W., Sher, Y., **Grover, S.**, Stern, R., Mohan, S.(2023). Heuristic Search For Physics-Based Problems: Angry Birds in PDDL+. ICAPS, Application Track. Also presented at SOCS 2023.
- **Grover, S.** (2022). Human-Aware AI Methods for Active Teaming. Arizona State University, Ph.D. Thesis.
- Agarwal, M., Chakraborti, T., **Grover, S.**, Chaudhary, A. (2021). COVID-19 India Dataset: Parsing Detailed COVID-19 Data in Daily Health Bulletins from States in India. *Neurips MLPH Workshop*.
- Strimel, G., **Grover, S.** (2021).Compression of machine learned models. U.S. Patent No 10,970,470. Washington, DC: U.S. Patent and Trademark Office.
- **Grover, S.**, Smith, D., Kambhampati, S. (2020). Model Elicitation through Direct Questioning. *ICAPS XAIP*.
- **Grover, S.**, Sengupta, S., Chakraborti, T., Prasad, A.M., Kambhampati, S., (2020). RADAR: Automated Task Planning for Proactive Decision Support. HCI (Special Issue on Unifying Human Computer Interaction and Artificial Intelligence). Also presented at *ICAPS, Journal Track*.
- Strimel, G., **Grover, S.** (2020).Compression of machine learned models. U.S. Patent No 10,558,738. Washington, DC: U.S. Patent and Trademark Office.
- **Grover, S.**, Sengupta, S., Chakraborti, T., Prasad, A.M., Kambhampati, S., (2019). iPass: A Case Study of the Effectiveness of Automated Planning for Decision Support. *NDM*, 2019
- Chakraborti, T., Sreedharan, S., **Grover, S.** and Kambhampati, S., (2019). Plan Explanations as Model Reconciliation—An Empirical Study. arXiv preprint arXiv:1802.01013. *HRI*, 2019.
- **Grover, S.**, Chakraborti, T. and Kambhampati, S., (2018). What can Automated Planning do for Intelligent Tutoring Systems?. *ICAPS SPARK*
- **Grover, S.**, Wetzel, J. and VanLehn, K., (2018, June). How Should Knowledge Composed of Schemas be Represented in Order to Optimize Student Model Accuracy?. In *AIED* (pp. 127-139). Springer, Cham.
- VanLehn, K., Chung, G., **Grover, S.**, Madni, A. & Wetzel, J. (2016). Learning science by constructing models: Can Dragon increase learning without increasing the time required? *International Journal of Artificial Intelligence in Education*, pp. 1-36
- **Grover, S.** (2015). Online Embedded Assessment for Dragon, Intelligent Tutoring System. Arizona State University, Master's thesis.
- **Grover, S.**, Arora, K., Mitra, S.K., Text Extraction from Document Images Using Edge Information, In *2009 Annual IEEE India Conference* (pp. 1-4). IEEE