

Sachin Grover

<https://sachingrover211.github.io>
<https://github.com/sachingrover211>

+1 480-295-2278
sachin.grover@asu.edu

EDUCATION

- **Arizona State University, Tempe** Arizona, USA
Ph.D. in Computer Science & Engineering Expected Spring 2022
– CGPA: 4.0/4.0
- **Arizona State University, Tempe** Arizona, USA
Master of Science in Computer Science & Engineering August 2013 - December 2015
– CGPA: 3.71/4.0

PUBLICATIONS & PATENTS

- 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 Dragoon increase learning without increasing the time required? *International Journal of Artificial Intelligence in Education*, pp. 1-36
- VanLehn, K., Wetzel, J, **Grover, S.** & van de Sande, B. (2016). Learning how to construct models of dynamic systems: An initial evaluation of the Dragoon intelligent tutoring system. *IEEE Transactions Learning Technology*
- **Grover, S.** (2015). Online Embedded Assessment for Dragoon, Intelligent Tutoring System. Arizona State University, Master's thesis.
- Wetzel, J., VanLehn, K., Chaudhari, P., Desai, A., Feng, J., **Grover, S.**, Joiner, R., Kong-Silvert, M., Patade, V., Samala, R., Tiwari, M. & van de Sande, B. (2016). The design and development of the Dragoon intelligent tutoring system for model construction: Lessons learned. *Interactive Learning Environments*, pp.1-21.
- **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

PROFESSIONAL EXPERIENCE

- **Applied Scientist Intern, Amazon** Mentor: Ross McGowan
Alexa NLP team, Pittsburgh, USA May 2021 – August 2021
 - Learn knowledge graph for text data using Graph Convolutional Networks.
 - Incorporate the learned embedding for intents and slots for improving end-to-end SLU model accuracy.
 - 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 to decrease memory size of cloud based NLP models.
- Implemented an optimization model to decrease memory footprint by 25% without effecting accuracy.

- **Research Assistant** Advisor: Prof. Subbarao Khambampati
Arizona State University *October 2016 – Present*
 - 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
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 modeling dynamic systems.
 - **Languages used:** JavaScript (Dojo framework based on AMD), PHP and MySQL.

RESEARCH EXPERIENCE & RELEVANT PROJECTS

- **Asking Directed Questions for Model Elicitation** Advisor: Prof. Subbarao Khambampati
YoChan Lab Project, ASU *May 2019 – Present*
 - Localize a particular model from a set of possible models for the human collaborator.
 - Designed an algorithm to create set of questions in the form of initial and goal states to ask the collaborator.
- **Planning for Intelligent Tutoring Systems** Advisor: Prof. Subbarao Khambampati
YoChan Lab Project, ASU *June 2017 – March 2018*
 - Learning 2.0 paradigm is about providing personalized technologies for growing population.
 - Incorporated planning techniques, to give feedback through active participation of the planner, create personalized curriculum, and create dynamic group using estimated student models.
- **Planning Techniques for Decision Support** Advisor: Prof. Subbarao Khambampati
YoChan Lab Project, ASU *October 2018 – May 2019*
 - Design and implement an interface to create a “Plan of Study” for a student.
 - Interface was used to evaluate the effectiveness of planning techniques for decision support.
- **Explanations as Model reconciliation** Advisor: Prof. Subbarao Khambampati
YoChan Lab Project, ASU *September 2017*
 - Design and run a study to test the effectiveness of explanations as a model reconciliation process.
- **Online Assessment of Student Learning - Dragoon** Advisor: Prof. Kurt VanLehn
Masters Thesis, ASU, R, Matlab, JavaScript, PHP *November 2014 – November 2015*
 - Dragoon is a tutoring software which teaches students to build models of dynamic systems.
 - Implemented *Bayesian Knowledge Tracing* (BKT), to assess student’s work in Dragoon problems.
 - Implemented algorithm to calibrate BKT and use problem difficulty, to improve accuracy.
- **System of equation solver** Advisor: Prof. Kurt VanLehn
Dragoon Lab, JavaScript *May 2017 – July 2017*
 - Implemented API for matrices with operations like inversion using LU decomposition.
 - Implemented Newton Raphson method to create a solver for system of equations, which is being used in TopoMath tutoring system.
- **Line Search Methods for Unconstrained Optimization** Advisor: Prof. Hans D. Mittlemann
Class Project, Group Size: 3, ASU, JAVA, AMPL *August 2014 – November 2014*
 - Implemented linear and non-linear (FR, PR, PR+ variants) conjugate gradient methods.
 - Implemented BFGS and memoryless BFGS (applied it to 90^3 by 90^3 sized problem) Quasi Newton methods.
 - Implemented optimization problems and solved them using AMPL solvers like Gurobi, CPLEX, KNITRO, and also using online compilers.
- **Making PeopleBot a People’s Bot** Advisor: Prof. Yu Zhang
Class Project, Group Size: 4, ASU, Python with RViz environment *September 2016 – November 2016*
 - The agenda of the project was to include a robot in a team meeting.
 - First phase was to recognize the members in the meeting, who were part of the conversation. Used HAAR classifiers for face recognition, online speaker detection using LSTMs, speech to text Google API.
 - Second phase was to measure coherence in member’s understanding of the discussion. Created NLP tagger using scikit-learn and HMMs to figure out whether the discussion is consistent or inconsistent.
- **Learning & Decision Making in Artificial Intelligence** Advisor: Prof. Subbarao Khambampati
Class Project, ASU, JAVA *September 2013 – November 2013*
 - Implemented Policy and Value iteration for a 4 cross 3 Robot environment.
 - Implemented Q Learning for the same robot environment, that is without learning the model.
 - Used Java Implementation of LDA on longer articles and twitter text corpus where each tweet was taken to be a separate document to analyse how the document size affects topic distribution.