# Abhinav Bhatia

Ph.D. student at University of Massachusetts Amherst | abhinavbhati@cs.umass.edu | abhinavbhatia.me

## Interests

Artificial Intelligence, Reinforcement Learning, Inverse Reinforcement Learning, Real-time Planning, Robotics

## Education

**University of Massachusetts Amherst** 3.94/4

*MS/Ph.D. in Computer Science, advised by Prof. Shlomo Zilberstein* *Fall 2019 – Present*

- At *Resource Bounded Reasoning* lab, I conduct research on metareasoning and meta-reinforcement-learning methods, to make autonomous agents operate safely and efficiently in real-time and with limited data.

**Birla Institute of Technology and Science (BITS) - Pilani, Pilani Campus** 9.27/10

*B.E. (Hons.) in Computer Science* *Aug. 2011 – May 2015*

## Experience

**Research Engineer** June 2017 – July 2019

*School of Computing and Information Sciences, Singapore Management University* *Singapore*

- Supervised by Prof. Pradeep Varakantham and Prof. Akshat Kumar.
- Worked on optimizing constrained resource allocation at city scale using deep reinforcement learning, which led to a publication at *International Conference on Automated Planning and Scheduling (ICAPS) 2019*.

**Software Engineer** August 2015 – June 2017

*WalmartLabs* *Bengaluru, India*

- Was part of *Operations, Analytics & Research* team for supply-chain division of Walmart's eCommerce.
- Developed an Elasticsearch based distributed database for data analysis.
- Developed a deep-learning based system for anomaly-detection in large live incoming data streams.

**Software Development Engineering Intern** January 2015 – June 2015

*Amazon* *Bengaluru, India*

- Worked on offline experience for Prime Video.
- Worked on optimizing content load time for Prime Video on Kindle tablets.

## Publications

**Abhinav Bhatia**, Samer B. Nashed and Shlomo Zilberstein (2023). "RL$^3$: Boosting Meta Reinforcement Learning via RL inside RL$^2$". In *(ArXiv 2023)*.

Samer B. Nashed, Justin Svegliato, **Abhinav Bhatia**, Stuart Russell and Shlomo Zilberstein (2022). "Selecting the partial state abstractions of MDPs: A metareasoning approach with deep reinforcement learning". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022)*.

**Abhinav Bhatia**, Justin Svegliato, Samer B. Nashed and Shlomo Zilberstein. "Tuning the Hyperparameters of Anytime Planning: A Metareasoning Approach with Deep Reinforcement Learning". In *Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS 2022)*.

**Abhinav Bhatia**, Philip S. Thomas, and Shlomo Zilberstein. "Adaptive Rollout Length for Model-Based RL Using Model-Free Deep RL". In *(ArXiv 2022)*.

**Abhinav Bhatia**, Justin Svegliato and Shlomo Zilberstein. "On the Benefits of Randomly Adjusting Anytime Weighted A*". In *Proceedings of the International Symposium on Combinatorial Search (SoCS 2021)*.

**Abhinav Bhatia**, Justin Svegliato and Shlomo Zilberstein. "Tuning the Hyperparameters of Anytime Planning: A Deep Reinforcement Learning Approach". In *ICAPS Workshop on Heuristics and Search for Domain-independent Planning (HSDIP 2021)*.

**Abhinav Bhatia**, Pradeep Varakantham and Akshat Kumar. "Resource Constrained Deep Reinforcement Learning". In *Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS 2019)*.

## Teaching Experience

**CS383 Artificial Intelligence** UMass Amherst
*Responsible for designing quizzes, clarifying students' doubts and holding office hours* *Fall 2022*

## Misc.

- Program committee member, AAAI 2023.
- Paper reviewer, AIJ 2021.
- As a member of IEEE BITS-Pilani chapter, conceptualized, developed and organized an AI bot making competition for a video game at college tech festival 2014.
- Won 1st prize for project *PC 3D Gesture Interface using Kinect* in design appliances category at BITS-Pilani tech festival 2014.
- Offered *Kishore Vaigyanik Protsahan Yojana* fellowship, which is an initiative by govt. of India to encourage young students to pursue a career science research, 2010.

## Programming Skills

**Languages**: Experienced in Python, Julia, C/C++, Java. Familiar with C#, SQL
**Framworks**: OpenAI Gym, PyTorch, FluxML, Tensorflow, CPLEX, Elasticsearch, Unity3D
Experienced in implementing a variety of deep reinforcement learning and planning algorithms.

## Relevant Ph.D. coursework

Artificial Intelligence, Reinforcement Learning, Robotics, Advanced Robot Dynamics & Control, Machine Learning, Neural Networks, Advanced Algorithms, Empirical Research Methods

## Links

**Webpage**: https://abhinavbhatia.me
**Github**: https://github.com/bhatiaabhinav
**Google Scholar**: https://scholar.google.com/citations?user=Y53CNrIAAAAJ&hl

## Contact Information

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