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, NeurIPS 2023 GenPlan workshop.
- Paper reviewer, JMLR, 2023.
- 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

Email: abhinavbhati@cs.umass.edu; abhinav.bhatia.me@gmail.com