Elita Lobo

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Education

From Sept 2022

Doctor of Philosophy (PhD) in Computer Science, University of Massachusetts Amherst
Advisor: Dr. Yair Zick
Research topic: Trusthworthy Reinforcement Learning and Machine Learning
My research centers on designing robust, fair, and reliable algorithms in Reinforcement Learning and Machine Learning.

Sept 2018 – Dec 2020

Masters in Computer Science, University of Massachusetts Amherst
Masters Thesis Advisors: Dr. Marek Petrik , Dr. Shlomo Zilberstein
Thesis title: *Near-Optimal Soft-Robust Markov Decision Processes.*   CGPA: 3.7

Jul 2012 – Jun 2016

Bachelor of Technology (BTech) in Electronics and Communication Engineering, National Institute of Technology Durgapur
Advisor: Dr. Rajib Kar   CGPA: 8.61
Thesis: *Floor Planning using Particle Search Optimization and Greedy Approach*

Publications

Patents

A Metahyperparameter Tuning Framework for Reinforcement Learning (2023) , **Elita Lobo**, Nhan Pham, Dharmashankar Subramanian, Tejaswini Pedapati (Under Review).

A novel system for metadata to glossary matching in data lakes using human feedback and generative models (2024) , **Elita Lobo**, Nhan Pham, Oktie Hassanzadeh, Dharmashankar Subramanian, Nandana Sampath Mihindukulasooriya, and Long Vu (Under Review).

Conference

On the Impact of Fine-Tuning on Chain-of-Thought Reasoning in LLMs, **Elita Lobo**, Chirag Agarwal, Hima Lakkaraju, Under Review, 2024

Alternate Preference Optimization for Unlearning Factual Knowledge in Large Language Models, Anmol Mekala, Vineeth Dorna, Shreya Dubey, Abhishek Lalwani, David Koleczek, Mukund Rungta, Sadid Hasan, **Elita Lobo**[1] **The 31st International Conference on Computational Linguistics, 2024**

Fair and Welfare-Efficient Resource Allocation under Uncertainty, **Elita Lobo***, Justin Payan*, Cyrus Cousins, Yair Zick, **The 37th Annual Conference on Neural Information Processing Systems, 2024**

On Welfare-Centric Fair Reinforcement Learning, Cyrus Cousins, **Elita Lobo**, Kavosh Asadi, Michael L. Littman, **The 1st Reinforcement Learning Conference, 2024 (Outstanding Paper Award)**

Axiomatic Aggregations of Abductive Explanations, Vignesh Viswanathan, **Elita Lobo**, Yacine Izza, Gagan Biradar, Yair Zick, **The 38th Annual AAAI Conference on Artificial Intelligence, 2023**

Percentile Criterion Optimization in Offline Reinforcement Learning, **Elita Lobo**, Cyrus Cousins, Marek Petrik, Yair Zick, **The 37th Annual Conference on Neural Information Processing Systems, 2023**

Data Poisoning Attacks on Off-Policy Policy Evaluation Methods, **Elita Lobo**, Harvineet Singh, Cynthia Rudin, Himabindu Lakkaraju, **The 38th Conference on Uncertainty in Artificial Intelligence, UAI 2022 (Top 5%)**

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[1]Supervised and mentored masters students involved in the project.

Publications (continued)

Workshops   ▌ Matching table metadata with business glossaries using large language models **Elita Lobo**, Oktie Hassanzadeh, Nhan Pham, Nandana Mihindukulasooriya, Dharmashankar Subramanian, Horst Samulowitz, **The 18th International Workshop on Ontology Matching, 2023**

▌ Percentile Criterion Optimization in Offline Reinforcement Learning, **Elita Lobo**, Cyrus Cousins, Marek Petrik, Yair Zick, **The 16th European Workshop on Reinforcement Learning, 2023**

▌ Soft-robust Algorithms for Batch Reinforcement Learning, **Elita Lobo**, Mohammad Ghavamzadeh,Marek Petrik, **R2AW Workshop, IJCAI 2021**

▌ Behavior Policy Search for Risk Estimators in RL, **Elita Lobo**, Yash Chandak, Dharmashankar Subramanian, Josiah Hanna, Marek Petrik, **Neurips Safe and Robust Control of Uncertain Systems, Neurips 2021**

▌ Data Poisoning Attacks on Off-Policy Policy Evaluation Methods, **Elita Lobo**, Harvineet Singh, Cynthia Rudin, Himabindu Lakkaraju, **ICLR 2022 Workshop on PAIR2Struct**

Other Research Projects

May 19 – May 21   ▌ **Near-Optimal Soft-Robust Markov Decision Process**
Developed soft-robust algorithms for handling model mis-specifications in Batch Reinforcement Learning.
Link: shorturl.at/kptwF
Advisor: Dr. Marek Petrik

Jan 19 – May 19   ▌ **Independent Study, Perceptual Robotics Lab,University of Massachusetts Amherst**
Developed a Hierarchical Reinforcement Learning framework for learning diverse skills in a task setting using Deep Embedded Encodings.
Link: shorturl.at/luEQS
Advisor: Dr. Roderic Grupen

Sep 18 – Dec 2018   ▌ **Independent Study, Center for Smart and Connected Societies, University of Massachusetts Amherst**
Worked on peak days forecast for peak shaving in energy grid using Deep Learning algorithms
Advisor: Dr. Prashant Shenoy

Employment History

Jan 24 – May 24   ▌ **Research Intern, Harvard Business School, MA**
Investigated the effects of finetuning on reasoning abilities of Large Language Models (LLMs).

Jun 24 – Aug 24   ▌ **Research Intern, Microsoft Research, India**
Working on developing methods to improve robustness of alignment algorithms for Small Language Models (SLMs).
Mentors: Gaurav Sinha, Nagarajan Natarajan

May 23 – Aug 23   ▌ **Research Intern, IBM Research, Yorktown Heights, NY**
Developed novel methods that leverage large language models (LLMs) and Human Feedback for accurate metadata to business glossaries matching problem.
Fine-tuned large language models (LLMs) using RLHF with Contrastive Loss to further improve accuracy of metadata to business glossaries matching.

Employment History (continued)

May 22 – Aug 22	**Research Intern, IBM Watson, Yorktown Heights, NY** *Developed novel algorithms for efficient hyperparameter tuning in Reinforcement Learning.*
May 21 – Aug 21	**Research Intern, IBM Watson, Yorktown Heights, NY** *Integrated existing Off-Policy Policy Evaluation algorithms in Automated Dynamic Optimization Framework.* *Developed a novel technique for minimising variance of risk-estimators in Reinforcement Learning using the influence function tool from Robust Statistics.*
Nov 20 – Feb 21	**Research Intern, Harvard Business School, MA** *Developed a novel data-poisoning attack framework for analyzing sensitivity of off-policy policy evaluation methods.*
Aug 17 – Jul 18	**Software Engineer, Flipkart, Bangalore** *Onboarded Price Drop Event in Accounting platform.* *Provided on call support for Inter warehouse good transfer service and inventory valuation service.* *Contributed to the development of inventory valuation system.* *Developed a Deep Learning based model to detect anomalous payouts made to sellers due to bugs introduced by frequent changes in the accounting system.* *Developed an efficient Stock Ledger generator API for capturing a monthly snapshot of large-scale good movements between various warehouses.* *Contributed to the development of invoice register API.*
Jul 16 – Aug 17	**Software Engineer, Endurance International Group, Bangalore** *Developed webpro orchestration layer API, smart search API for customers and session manager for OrderBox.* *Developed a service to detect if a domain is parked using ML.* *Developed a fast image-search app (Imagio) that allows users to query for trending images based on keywords and filter them by color and type.* *Developed a web app for recommending trending images to small businesses based on textual data in their websites.*
Sept 16 – Mar 17	**Research Trainee, Indian Institute of Science, Bangalore** *MSR Codes: Contributed to the integration of minimum storage regenerating code in Ceph. Link :shorturl.at/sFRW9*
Sept 2015 – Jan 16	**Part-time Problem Setter, HackerRank** *Developed coding problems for competitive coding contests*
May 15 – Aug 15	**Software Engineer Intern, GoIbibo, Bangalore** *Designed a Machine Learning framework to predict time to live of each flights search results to be cached to reduce the no of price invalidations that occur when navigating from search page to booking page.* *Developed a Distributed In-Memory Cache wherein the servers in the network communicate using Bus Protocol.*
May 2014 – Aug 14	**Software Engineer Intern, Google Summer of Code** *Revamped the User Interface of Gnome-Calculator, implemented the Keyboard Mode and History View in the Gnome-Calculator.*

Courses taken

Relevant Graduate Coursework ▮ Reinforcement Learning, Convex Optimization, Probabilistic Graphical Models, Machine Learning , Artificial Intelligence, Advanced Algorithms, Information Assurance, Advanced Machine Learning Seminar: Theory of Bandits, Statistical Methods for Research Math, Principles of Statistical Inference Math, Data Mining and Predictive Analytics Math

Miscellaneous Experience

Awards and Achievements

2024 ▮ *Recipient of Thesis Writing Fellowship in Computer Science ($15k)*

2023 ▮ *Recipient of Anuradha and Hanuma Kodavalla Graduate Scholarship in Computer Science ($10k)*

2020 ▮ *Recipient of UNH CEPS Graduate Fellowship*

2019 ▮ *Recipient of UMass Robin Popplestone Fellowship in Robotics and Artificial Intelligence ($5k)*

2018 ▮ *1st Place in Hackday 10 (Marketplace Category),Flipkart*

▮ *3rd Place in ML Challenge 3, Flipkart*

2017 ▮ *2nd Place in ML challenge 2,Flipkart*

▮ *1st Place in Hackathon,Endurance International Group*

▮ *98 rank in Google Code Jam to IO for Women,2017*

2013 ▮ *1st Place in Trickology (Competitive Coding), Department of MCA, NIT Durgapur*

2012 ▮ *99 percentile in All India Engineering Entrance Exam 2012 (State Rank 9)*

▮ *State rank 11 (99.9 percentile) in Goa Engineering Entrance Exam 2012*

Professional Services

Teaching Assistant ▮ Assisted in courses in computer science: *Operating Systems CS377 (2018 Fall), Reasoning under Uncertainity CS240 (2019 Spring), Numerical Optimization CS590OP (2019 Fall), Convex Optimization CS690OP (2020 Spring)*

Reviewer ▮ Served as a reviewer for leading conferences: UAI 2023, ICML 2023, JAIR 2024, ICML 2024, ICLR 2024.

Mentoring ▮ Participated in the PhD Applicant Support Program to help underrepresented students with their graduate applications in 2023 and 2024.

Skills

Programming Languages and Tools ▮ C/C++, Python, Java, GoLang, Ruby, R, MySQL, Spring Boot, Elastic Search, Pytorch, TensorFlow, Keras, Machine Learning, Deep Learning, Large Language Models (LLMs)

References

PhD advisor: ▮ Dr. Yair Zick [yzick@umass.edu]

Masters Thesis advisors: ▮ Dr. Shlomo Zilberstein [shlomo@cs.umass.edu], Dr. Marek Petrik [mpetrik@cs.unh.edu]