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PhD Candidate, Cornell University (Computer Science).

Research Interest

I am interested in developing models and learning algorithms with emphasis on applications in natural language understanding. For example, building agents that can follow instructions, answer questions or hold a conversation. I am currently active in the following research areas: grounded natural language understanding, language and vision problems, semantic parsing, deep reinforcement learning, PAC reinforcement learning theory and model based reinforcement learning.

Education

- PhD (Computer Science), Cornell University (Aug 2013 - May 2019 Expected)
Advisor: Yoav Artzi. Other committee members: Noah Snaveley, Hadas Kress-Gazit. (GPA 4.0)
- B-Tech (Computer Science and Engineering), IIT Kanpur (Aug 2009 - May 2013)
Second Rank in Graduating Batch (CPI 9.8/10)

Awards and Fellowships

- Amazon AWS research grant (2014-2015).
- Cornell University Fellowship (2013-2014).
- Received OPJEMS Merit scholarship for 2011-12 and 2012-13 which is awarded to around 20 students in the same batch from all over India.
- Academic Excellence Award for all years at IIT Kanpur.
- Certificate of merit in National Standard Examination in Physics 2007.

Publications

- *Towards a Simple Approach to Multi-step Model-based Reinforcement Learning.*
Kavosh Asadi, Evan Carter, Dipendra Misra, Michael Littman.
(arXiv preprint), 2018. Preliminary version accepted at Deep RL workshop at NeurIPS 2018.
- *Touchdown: Natural Language Navigation and Spatial Reasoning in Visual Street Environments.*
Howard Chen, Alane Suhr, Dipendra Misra, Noah Snaveley, Yoav Artzi.
(arXiv preprint), 2018. Preliminary version accepted at VIGIL workshop at NeurIPS 2018.
- *Early Fusion for Goal Directed Robotic Vision.*
Aaron Walsman, Yonatan Bisk, Saadia Gabriel, Dipendra Misra, Yoav Artzi, Yejin Choi, Dieter Fox.
(arXiv preprint), 2018.
- *Mapping Navigation Instructions to Continuous Control Actions with Position Visitation Prediction.*
Valts Blukis, Dipendra Misra, Ross A. Knepper, and Yoav Artzi.
In proceedings of the Conference on Robot Learning (CoRL), 2018.
- *Policy Shaping and Generalized Update Equations for Semantic Parsing from Denotations.* [Selected Publication]
Dipendra Misra, Ming-Wei Chang, Xiaodong He and Wen-tau Yih.
In proceedings of Empirical Methods in Natural Language Processing (EMNLP), 2018.
- *Mapping Instructions to Actions in 3D Environments with Visual Goal Prediction.* [Selected Publication]
Dipendra Misra, Andrew Bennett, Valts Blukis, Eyvind Niklasson, Max Shatkhin, and Yoav Artzi.
In proceedings of Empirical Methods in Natural Language Processing (EMNLP), 2018.
- *Equivalence Between Wasserstein and Value-Aware Model-based Reinforcement Learning.*
Kavosh Asadi, Evan Carter, Dipendra Misra and Michael Littman.
In workshop on Prediction and Generative Modeling in Reinforcement Learning at ICML, 2018.
- *Lipschitz Continuity in Model-based Reinforcement Learning.* [Selected Publication]
Kavosh Asadi*, Dipendra Misra* and Michael Littman (* equal contribution).
In proceedings of the International Conference on Machine Learning (ICML), 2018.
- *CHALET: Cornell House Agent Learning Environment.*
Claudia Yan, Dipendra Misra, Andrew Bennett, Aaron Walsman, Yonatan Bisk and Yoav Artzi.
In CoRR, 2018.
- *Reinforcement Learning for Mapping Instructions to Actions with Reward Learning.*
Dipendra Misra and Yoav Artzi.
In AAAI Symposium on Natural Communication for Human-Robot Collaboration (NCHRC), 2017.
- *Mapping Instructions and Visual Observations to Actions with Reinforcement Learning.* [Selected Publication]
Dipendra Misra, John Langford and Yoav Artzi.
In proceedings of Empirical Methods in Natural Language Processing (EMNLP), 2017.

- *Neural Shift-Reduce CCG Semantic Parsing*.
Dipendra Misra and Yoav Artzi.
In proceedings of Empirical Methods in Natural Language Processing (EMNLP), 2016.
- *Environment-Driven Lexicon Induction for High-Level Instructions*.
Dipendra Misra, Kejia Tao, Percy Liang, Ashutosh Saxena.
In proceedings of Association of Computational Linguistics (ACL), 2015.
- *Tell Me Dave: Context-Sensitive Grounding of Natural Language to Mobile Manipulation Instructions*.
Dipendra Misra, Jaeyong Sung, Kevin Lee, Ashutosh Saxena.
In an invited edition of International Journal of Robotics Research (IJRR 2015).
- *Robo Brain: Large-Scale Knowledge Engine for Robots*.
Ashutosh Saxena, Ashesh Jain, Ozan Sener, Aditya Jami, Dipendra Misra and Hema S Koppula.
In proceedings of International Symposium on Robotic Research (ISRR), 2015.
- *Tell Me Dave: Context-Sensitive Grounding of Natural Language to Mobile Manipulation Instructions*.
Dipendra Misra, Jaeyong Sung, Kevin Lee, Ashutosh Saxena.
In Robotics: Science and Systems (RSS), 2014.

Employment History

Research Experience

- Research Intern, Microsoft Research New York. Advisor: John Langford and Akshay Krishnamurthy (Fall 2018)
- Research Intern, Microsoft Research Redmond. Advisor: Ming-Wei Chang, Scott Yih and Xiaodong He (Summer 2017)
- Visiting Researcher at Stanford AI Lab, Stanford University. Worked with Percy Liang. (Aug 2014 - July 2015)
- Summer Research Intern, Carnegie Mellon University. (Summer 2012)
Advisor: Raj Rajkumar, Research: Parallel Vision and Planning Algorithms for Autonomous Cars.

Teaching Experience

- Teaching Assistant for Data Science Course. Instructor: Serge Belongie. (Spring 2017)
- Teaching Assistant for Natural Language Processing Course. Instructor: Yoav Artzi. (Spring 2016)

Professional Services

- Co-organized the third edition of the workshop on Representation Learning for Natural Language Processing (Rep4NLP) to be held at ACL 2018, Melbourne, Australia.
- I have served (* serving currently) as program committee member for machine learning, natural language processing and robotics conferences:
 - ML: AISTATS 2018 (*), NIPS 2018, ICML 2018
 - NLP: NAACL 2018 (*), EMNLP 2018, ACL 2018, EMNLP 2017, ACL 2017, EMNLP 2016, EACL 2016, MASC 2015, SEM-ACL 2016.
 - Robotics: JAIR 2018, ICRA 2016, HRI 2016, RO-MAN 2016, ISRR 2015, RSS 2014.

Mentoring

I had the opportunity to mentor the following interns and learn from them:

- Eyvind Niklasson (2017-2018, Master Student at Cornell Tech): Worked on deep reinforcement learning for instruction following and published a paper with me at EMNLP 2018. Now at Gro Intelligence.
- Max Shatkhin (2017-2018, Master Student at Cornell Tech): Worked on deep reinforcement learning for instruction following and published a paper with me at EMNLP 2018. Now at imagen.ai.
- Claudia Yan (2016, City College of New York): Developed the CHALET platform and wrote a paper on it. Now at IBM.
- Kejia Tao (2015, Undergrad at Cornell University): Worked on graphical models for instruction following and published a paper with me at ACL 2015.
- Kevin Lee (2013, Undergrad at Cornell University): Worked on simulations for instruction following and published papers with me at RSS 2014 and IJRR 2015.

Invited Talks and Presentations

- *Mapping Instructions and Visual Observations to Actions with Reinforcement Learning* at Amazon Graduate Student Symposium (Seattle). Oct 2017
- *Mapping Instructions and Visual Observations to Actions with Reinforcement Learning* at Microsoft Research (New York). April 2017
- Stanford-Berkely Robotics Symposium, Stanford University. Oct 2015.
- Invited lecture at meeting of Calcutta Logic Circle on *limits of diagonalization*, celebrating Alan Turing year. Fall 2012.
- Invited lecture at Indo-German Winter Academy on *iterative methods and conjugate gradient algorithms*. Dec 2011.

Coursework

Graduate: Computer Vision, Structured Prediction for NLP, Advanced Topics in Machine Learning, Analysis of Algorithms, Decision Theory I, Advanced Systems, Advanced Topics Robot Learning: 3D. GPA: 4.0/4.0

Undergraduate: Algorithms, Datastructure and Algorithm, Functional Programming Language, Data Mining, Artificial Intelligence, Cognitive Science, Complexity Theory, Automata Theory, Operating System, Compiler Design, Linear Algebra and Complex Analysis, Calculus. GPA: 3.9/4.0

Technical Skills

Neural network libraries: tensorflow, pytorch, dynet, dl4j

Programming languages: python, c, java, haskell, javascript, php, ruby, cuda

Other skills: unity3d editor, ruby on rails, web designing