Benjamin Eisner

Curriculum Vitae

Contact Information

Carnegie Mellon University
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Research Interests

Learning for manipulation, deep reinforcement learning, 3D perception

Education

Carnegie Mellon University, Pittsburgh, Pennsylvania USA **August 2020 -**

Ph.D. in Robotics, Robotics Institute - School of Computer Science

Advisor: David Held

Coursework: *Intermediate Statistics (36-705), Computer Vision (16-720), Kinematics/Dynamics/Control (16-711), Deep RL for Robotics (16-881), Advanced ML (10-715)*

Princeton University, Princeton, New Jersey USA **Sept. 2013 - Jun. 2017**

Bachelor of Science in Engineering, Computer Science

Graduated with High Honors (Magna Cum Laude)
GPA: 3.51 / Departmental GPA: 3.64

Thesis: "Deep Learning methods for 3D segmentation of neural tissue in EM images"
Advisor: Sebastian Seung

University College London, London UK **Jan. 2016 - Jun. 2016**

Affiliate Student in Computer Science

Experience

Samsung AI Center, New York, New York USA **Nov. 2018 - Aug. 2020**

Machine Learning Research Engineer

Advisors: Daniel Lee, Sebastian Seung, Larry Jackel

- Developed novel deep reinforcement learning algorithms for exploration in sparse environments and improved training stability, leading to a conference paper (IJCAI-PRICAI 2020) and a workshop paper (ICML 2019).
- Collaborated on a project that fused traditional planning with deep learning to learn diverse manipulation behaviors, resulting two publications (including IROS 2019).
- Designed a complete system for robotic manipulation using the Kinova Gen3 arm, as well as low-level drivers for the RealSense camera, a dynamic vision sensor, and Syntouch touch sensors.
- Architected a comprehensive deep reinforcement learning framework for large-scale distributed learning and experimentation.

Google, New York, New York USA **Sept. 2017 - Nov. 2018**

Software Engineer (L3 & L4) - Geo Data

- Led an organization-wide effort to test how massive data changes affected the Google Maps API.
- Developed a workflow management system for simulating world-scale launches for Google Maps and Knowledge Graph.
- Consistently managed tens of simultaneous experiments that processed petabytes of data across thousands of nodes, enabling major org-wide launches.

Princeton University, Princeton, New Jersey USA **Jan. 2015 - May 2017**

Lab Teaching Assistant

- Assisted undergraduates with programming assignments for introductory Computer Science courses.

Machine Reading Lab @ UCL, London UK **Jan. 2016 - Nov. 2016**

Research Intern

Advisors: Sebastian Riedel, Tim Rocktaschel

- Researched ways to learn embeddings for new tokens based only on short, natural language descriptions, leading to a workshop publication at EMNLP 2016.
- Demonstrated quantitative improvements on downstream NLP tasks (i.e. Twitter Sentiment Classification) using learned Emoji embeddings.

Google, Kirkland, Washington USA **Jun. 2016 - Sept. 2016**

Software Engineering Intern

Microsoft, Redmond, Washington USA **Jun. 2015 - Sept. 2015**

Software Engineering Intern

Contactive, New York, New York USA **Jun. 2014 - Dec. 2014**

Software Engineering Intern

Konica Minolta Medical Imaging, Wayne, New Jersey USA **Jul. 2013 - Aug. 2013**

Software Development Intern

Honors and Awards

NSF Graduate Research Fellowship **2020 - present**

High Honors, Department of Computer Science, Princeton University 2017

Elected to Sigma Xi 2017

Best Paper, SocialNLP Workshop at EMNLP 2016 2016

National Merit Scholar 2013

Publications

2021

Narasimhan, G., Zhang, K., **Eisner, B.**, Lin, X., & Held, D. (2021) Transparent Liquid Segmentation for Robotic Pouring. *Under Review at ICRA 2022.* `https://sites.google.com/view/transparentliquidpouring`

Yang, D., Tosun, T., **Eisner, B.**, Isler, V., & Lee, D. (2021). Robotic Grasping through Combined image-Based Grasp Proposal and 3D Reconstruction. **ICRA 2021**. `https://arxiv.org/abs/2003.01649`

2020

Simmons-Edler, R., **Eisner, B.**, Yang, D., Bisulco, A., Mitchell, E., Seung, S., & Lee, D. (2020). Reward Prediction Error as an Exploration Objective in Deep RL. **International Joint Conference on Artificial Intelligence 2020 (IJCAI-PRICAI2020)**. `https://arxiv.org/abs/1906.08189`

2019

Tosun, T., Mitchell, E., **Eisner, B.**, Huh, J., Lee, B., Lee, D., ... & Lee, D. (2019). Pixels to Plans: Learning Non-Prehensile Manipulation by Imitating a Planner. **IROS 2019**. `https://arxiv.org/abs/1904.03260`

Simmons-Edler, R.*, **Eisner, B.***, Mitchell, E.*, Seung, S., & Lee, D. (2019). Q-Learning for Continuous Actions with Cross-Entropy Guided Policies. **RL4RealLife Workshop, ICML 2019**. `https://arxiv.org/abs/1903.10605`

2016

Eisner, B., Rocktäschel, T., Augenstein, I., Bošnjak, M., & Riedel, S. (2016). emoji2vec: Learning emoji representations from their description. **Best Paper, SocialNLP Workshop, EMNLP 2016**. `https://arxiv.org/abs/1609.08359`

Presentations

Mapping Your Brain with Deep Learning 2017
Internal talk at Google NYC

emoji2vec: Learning emoji representations from their description. 2016
SocialNLP Workshop at EMNLP 2016