

Benjamin Eisner

Curriculum Vitae

CONTACT INFORMATION	Carnegie Mellon University Pittsburgh, PA 15232	<i>Email:</i> baeisner@andrew.cmu.edu <i>Site:</i> www.beisner.me
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 GPA: 4.04 Coursework: <i>Intermediate Stats (36-705)</i> , <i>Computer Vision (16-720)</i> , <i>Kinematics & Dynamics (16-711)</i> , <i>Deep RL for Robotics (16-881)</i> , <i>Advanced ML (10-715/10-716)</i> , <i>3D Learning (16-889)</i>	
	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	DeepMind , London, UK July 2022 - Nov. 2022 <i>Research Scientist Intern - Visual Learning for Manipulation</i> Collaborators: Jon Scholz, Yi Yang, Todor Davchev, Mel Vecerik <ul style="list-style-type: none">• Researched ways to incorporate 3D visual inductive biases into large-scale robot learning systems.• Developed a provably SE(3)-Equivariant architecture for learning relative object placement tasks from demonstrations.	
	Samsung AI Center , New York, New York USA Nov. 2018 - Aug. 2020 <i>Machine Learning Research Engineer</i> Advisors: Daniel Lee, Sebastian Seung, Larry Jackel <ul style="list-style-type: none">• 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.	

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

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	Best Paper Finalist, RSS 2022	2022
	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 **2023**

Zhang, H., **Eisner, B.**, Held, D. (2023). FlowBot++: Learning Generalized Articulated Objects Manipulation via Articulation Projection. *CoRL 2023*. <https://sites.google.com/view/flowbotpp/home>

Qureshi, M. N., **Eisner, B.**, Held, D. (2023). On Time-Indexing as Inductive Bias in Deep RL for Sequential Manipulation Tasks. *LmMbmG Workshop @ IROS 2023*.

2022

Pan, C.*, Okorn, B.*, Zhang, H.*, **Eisner, B.***, Held, D. (2022). TAX-Pose: Task-Specific Cross-Pose Estimation for Robot Manipulation. *Under submission to CoRL 2022*. <https://sites.google.com/view/tax-pose/home>

Eisner, B.*, Zhang, H.*, Held, D. (2022). FlowBot3D: Learning 3D Articulation Flow to Manipulate Articulated Objects. **Best Paper Finalist, RSS 2022**. <https://sites.google.com/view/articulated-flowbot-3d>

Qureshi, M. N., **Eisner, B.**, Held, D. (2022). Deep Sequenced Linear Dynamical Systems for Manipulation Policy Learning. **NeurIPS 2022 Workshop**. <https://sites.google.com/view/deep-sequenced-lds>

Narasimhan, G., Zhang, K., **Eisner, B.**, Lin, X., & Held, D. (2022) Self-supervised Transparent Liquid Segmentation for Robotic Pouring. **ICRA 2022**. <https://sites.google.com/view/transparentliquidpouring>

2021

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	FlowBot3D: Learning 3D Articulation Flow to Manipulate Articulated Objects <i>Long Oral, Best Paper Finalist, RSS 2022</i>	2022
	Mapping Your Brain with Deep Learning <i>Internal talk at Google NYC</i>	2017
	emoji2vec: Learning emoji representations from their description. <i>SocialNLP Workshop at EMNLP 2016</i>	2016