

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.• Published the resulting manuscript at ICLR 2024.	
	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

2024

Eisner, B., Yang, Y., Davchev, T., Vecerik, M., Scholz, J., & Held, D. (2024). Deep SE(3)-Equivariant Geometric Reasoning for Precise Placement Tasks. **ICLR 2024**. <https://openreview.net/forum?id=2inBuwTyL2>

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. **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