

# Benjamin Eisner

## *Curriculum Vitae*

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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	<b>Carnegie Mellon University</b> , Pittsburgh, Pennsylvania USA <b>August 2020 -</b> Ph.D. in Robotics, Robotics Institute - School of Computer Science Advisor: David Held Coursework: <i>Intermediate Stats (36-705)</i> , <i>Computer Vision (16-720)</i> , <i>Kinematics &amp; 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>	
	<b>Princeton University</b> , Princeton, New Jersey USA <b>Sept. 2013 - Jun. 2017</b> 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	
	<b>University College London</b> , London UK <b>Jan. 2016 - Jun. 2016</b> Affiliate Student in Computer Science	
EXPERIENCE	<b>DeepMind</b> , London, UK <b>July 2022 - Nov. 2022</b> <i>Research Scientist Intern - Visual Learning for Manipulation</i>	
	<b>Samsung AI Center</b> , New York, New York USA <b>Nov. 2018 - Aug. 2020</b> <i>Machine Learning Research Engineer</i> Advisors: Daniel Lee, Sebastian Seung, Larry Jackel <ul style="list-style-type: none"><li>• 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).</li><li>• Collaborated on a project that fused traditional planning with deep learning to learn diverse manipulation behaviors, resulting two publications (including IROS 2019).</li><li>• 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.</li><li>• Architected a comprehensive deep reinforcement learning framework for large-scale distributed learning and experimentation.</li></ul>	
	<b>Google</b> , New York, New York USA <b>Sept. 2017 - Nov. 2018</b> <i>Software Engineer (L3 &amp; L4) - Geo Data</i> <ul style="list-style-type: none"><li>• Led an organization-wide effort to test how massive data changes affected the Google Maps API.</li></ul>	

- 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	<p><b>NSF Graduate Research Fellowship</b> <span style="float: right;"><b>2020 - present</b></span></p> <p>High Honors, Department of Computer Science, Princeton University <span style="float: right;">2017</span></p> <p>Elected to Sigma Xi <span style="float: right;">2017</span></p> <p>Best Paper, SocialNLP Workshop at EMNLP 2016 <span style="float: right;">2016</span></p> <p>National Merit Scholar <span style="float: right;">2013</span></p>
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PUBLICATIONS	<p><b>2022</b></p> <p>Pan, C.*, Okorn, B.*, Zhang, H.†, <b>Eisner, B.</b>†, Held, D. (2022). TAX-Pose: Task-Specific Cross-Pose Estimation for Robot Manipulation. <i>Under submission to CoRL 2022</i>. <a href="https://sites.google.com/view/tax-pose/home">https://sites.google.com/view/tax-pose/home</a></p> <p><b>Eisner, B.*</b>, Zhang, H.*, Held, D. (2022). FlowBot3D: Learning 3D Articulation Flow to Manipulate Articulated Objects. <b>Best Paper Finalist, RSS 2022</b>. <a href="https://sites.google.com/view/articulated-flowbot-3d">https://sites.google.com/view/articulated-flowbot-3d</a></p>
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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	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