Curriculum Vitae

Eric Cai

ey-cai.github.io eycai@andrew.cmu.edu

PUBLICATIONS

Cai, E., Donca, O., Eisner, B., Held, D. Non-rigid Relative Placement through 3D Dense Diffusion. *Conference on Robot Learning (CoRL)*, 2024. [project page]

Eisner, B., **Cai, E.**, Donca, O., Vitchutripop, T., Held, D. Sequential Object-Centric Relative Placement Prediction for Long-horizon Imitation Learning. *Learning Effective Abstractions for Planning (LEAP) Workshop @ Conference on Robot Learning (CoRL)*, 2024.

Brown, J.*, Vitchutripop, T.*, **Cai, E.**, Wang, J., Held, D. TaskSeg: Unsupervised Deep Instruction Tuning for Few Shot Object Segmentation. *Under Review*, 2025. [project page]

EDUCATION

Carnegie Mellon University Aug. 2023 - Present
M.S. in Robotics *Pittsburgh, Pennsylvania USA*

- GPA: 3.92 | Advisor: David Held
- Coursework: Learning for 3D Vision, Advanced Computer Vision

Washington University in St. Louis Aug. 2017 - May 2021
B.S. in Computer Science *St. Louis, Missouri USA*

- GPA: 3.85 | Magna Cum Laude | Second Major in Mathematics
- Coursework: Machine Learning, Bayesian Statistics, Mathematical Statistics, Stochastic Processes, Probability, Mathematical Foundations of Big Data, Linear Statistical Models

RESEARCH EXPERIENCE

Carnegie Mellon University Oct. 2023 - Present
Graduate Researcher *Pittsburgh, Pennsylvania USA*

- *Lab:* Robots Perceiving and Doing (R-PAD) Lab | *Advisor:* David Held
- Interests: robot learning, manipulation, 3D vision
- Researching point cloud diffusion for goal-conditioned policy learning.
- Researched visual representation learning methods for generalizable goal prediction for deformable and long-horizon manipulation tasks.
- Researched flow-based methods for unsupervised novel object segmentation and learning from human demonstration (Mentorship: Jessica Brown).

INDUSTRY EXPERIENCE

The Boeing Company Jul. 2021 - Jul. 2023
Data Scientist *St. Louis, Missouri USA*

- Led corrosion prediction effort for the F/A-18 Service Life Modification program by developing machine learning methods for millions of US Navy and Boeing maintenance records.
- Implemented part-agnostic training to extend F/A-18 anomaly detection and remaining useful life framework to larger aircraft sensor systems.

The Boeing Company May 2020 - Aug. 2020
Data Science Intern *St. Louis, Missouri USA*

- Researched deep sequence modeling for the F/A-18 anomaly detection framework and matched performance against state-of-the-art methods on public part-failure prediction benchmarks.
- Implemented natural language processing framework to perform white-box predictive modeling for COVID-19 supplier impact tracking snapshot data.

DataProphet Jul. 2019 - Aug. 2019
Data Science Intern *Cape Town, South Africa*

- Designed Blender-Python pipeline from scratch to procedurally generate synthetic photorealistic dataset of defective automotive parts.
- Trained real-world automotive foundry defect detection model with RetinaNet CNN architecture, using only synthetic training data.

TEACHING & SERVICE

Teaching (WashU): TA for Introduction to Machine Learning (Spring, Fall 2019)
Conference Reviewer: ICRA (2025)
Mentorship: CMU Robotics Institute Summer Scholars (2024)

HONORS & AWARDS

Distinction in Mathematics	2021
Magna Cum Laude	2021
4x Dean's List	2017 - 2021
1x USA Physics Olympiad Qualifier	2017
5x American Invitational Mathematics Examination Qualifier	2013 - 2017