

# ANNAMARIE E. BAIR

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## EDUCATION

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### Carnegie Mellon University

PhD student in the Machine Learning Department  
Advisor: Zico Kolter

September 2020-present

### Massachusetts Institute of Technology (MIT)

Master of Engineering in Computer Science  
*Thesis: Molecular Graph Self Attention and Graph Convolution for Drug Discovery*

September 2019

Bachelor of Science in Computer Science and Engineering  
*Minor in Brain and Cognitive Sciences*

June 2018

## RESEARCH

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**Nvidia AV Perception Research, Dr. Jose Alvarez**  
*Research Intern*

May 2022 - January 2023  
*Remote*

Led a research project investigating the deleterious effects of pruning on natural robustness in computer vision tasks for convolutional neural networks. We developed a new optimization method that allows models to be pruned while retaining more of their robust performance. This work is currently under submission.

**Universitat Pompeu Fabra Complex Systems Lab, Prof. Ricard Sole**  
*Fulbright Predoctoral Researcher*

September 2019 - June 2020  
*Barcelona, Spain*

Developed theory and wrote simulations for projects analyzing parabolic replicator dynamics and distributed biological intelligence. Chosen to deliver a research presentation on complex systems at the Fulbright Spain Mid-Year Seminar.

**MIT CSAIL Clinical Decision Making Group, Prof. Peter Szolovits**  
*SuperUROP and Master's Research*

May 2017 - September 2019  
*Cambridge, MA*

Used graph convolutional networks with self-attention and position embeddings to perform molecule property prediction. Used machine learning methods to model gene expression data and analyze co-regulated genes. Work resulted in a poster presentation at the Women in Machine Learning (WiML) workshop.

**MIT Interactive Robotics Group, Prof. Julie Shah**  
*UROP*

September 2015 - April 2016  
*Cambridge, MA*

Conducted experiments that assessed situational awareness in human-robot interaction. Performed statistical analysis of experimental results. Work resulted in a publication in The International Journal of Robotics Research (IJRR).

## PUBLICATIONS

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- Rice, L., **Bair, A.**, Zhang, H., & Kolter, J. Z. (2021). Robustness between the worst and average case. *NeurIPS 2021*.
- Gombolay, M., **Bair, A.**, Huang, C., & Shah, J. (2017). Computational design of mixed-initiative human-robot teaming that considers human factors: situational awareness, workload, and workflow preferences. *The International Journal of Robotics Research*, 36(57), 597 – 617. <https://doi.org/10.1177/0278364916688255>

## PRESENTATIONS

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- **Bair, A.**, McDermott, M., Wang, J., Zhao, W., Sheridan, S., Szolovits, P., Kohane, I., Haggarty, S., & Perlis, R. (2018, December 3). *Improved modeling and analysis of gene expression*. Poster presented at Women in Machine Learning (WiML) Workshop, co-located with NeurIPS 2018, Montréal, Canada.
- **Bair, A.**, McDermott, M., Wang, J., Zhao, W., Sheridan, S., Szolovits, P., Kohane, I., Haggarty, S., Perlis, R. (2019, March 4). *Using Machine Learning to Improve Drug Development*. Poster presented at Women in Data Science (WiDS) Cambridge Conference, Cambridge, MA.

## INDUSTRY

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**Microsoft**  
*Software Engineering Intern*

June 2018 - August 2018  
*Redmond, WA*

Migrated data quality metrics from SQL to NoSQL database. Improved and refactored existing codebase using C#, U-SQL, and T-SQL.

**Driver***Software Engineering Intern*

June - August 2017

*San Francisco, CA*

Built an API using Python, PostgreSQL, and Flask for a consumer technology company building a platform to give cancer patients access to new treatments. API stores patient information and integrates with internal services to automate ordering of medical diagnostic test kits from a third party vendor.

**The New York Times***Software Engineering Intern*

June - August 2016

*New York, NY*

Designed and implemented improvements to a mobile website using Javascript, HTML, and CSS. Determined how to improve the user experience of a mobile web app in collaboration with a designer and carried project through the entire development process until the product was deployed to production. Created an iOS prototype for a social feature for The New York Times Cooking App.

**TEACHING**

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**MIT Women's Technology Program (WTP) Instructor***Math for Electrical Engineering and Computer Science*

June - July 2019

*Cambridge, MA*

Taught at a program for rising high school senior girls to gain exposure to computer science and engineering. Worked with three MIT student teaching assistants to prepare and deliver lectures on introductory math for computer science topics, including binary numbers, algorithms, linear algebra, and graph theory.

**MIT Teaching Assistant***Introduction to Computer Science and Programming (6.00)*

September 2018 - June 2019

*Cambridge, MA*

Taught weekly recitation sections, wrote problem sets, and held office hours.

**MIT Lab Assistant***Introduction to Computer Science and Programming (6.00)*

January - June 2018

*Cambridge, MA*

Assisted students with problem sets, gave check-offs, and debugged problem sets before release.

**La Miranda School Instructor***Varied*

January 2018

*Barcelona, Spain*

Developed lesson plans and taught math, coding, physics, biology, and English to students in grades 6 through 12.

**MIT Lab Assistant***Computation Structures (6.004)*

September - December 2017

*Cambridge, MA*

Assisted students with labs, gave check-offs, helped students with quiz preparation.

**AWARDS**

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- Fulbright Predoctoral Research Grantee, Barcelona, Spain, 2019-2020

**SKILLS**

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**Programming:** Python, Java, C#, SQL, MATLAB, JavaScript, HTML/CSS  
**Languages:** Spanish (Proficient)