Benjamin Fish

Contact Information

Computer Science and Engineering
Bob and Betty Beyster Building
2260 Hayward Street
Ann Arbor, MI 48109

benfish@umich.edu
http://ben.fish/

Education

University of Illinois at Chicago, Chicago, IL

Ph.D. in Mathematics (specializing in Mathematical Computer Science), 2018.
Advised by Lev Reyzin.
M.S. in Mathematics, 2015.

Pomona College, Claremont, CA

B.A. in Mathematics and Computer Science, 2009 – 2013.
Graduated cum laude.

Employment And Research Experience

University of Michigan, Ann Arbor, MI.

Assistant Professor, 2021 – present.

Mila - Quebec AI Institute/Microsoft Research Montréal, Montréal, QC, Canada.

Postdoctoral Researcher advised by Fernando Diaz, 2018 – 2021.

University of Illinois at Chicago, Chicago, IL.

Research Assistant, 2016, 2017.
Graduate Teaching Assistant, 2013 – 2017. Led discussion sections for Pre-calculus, Calculus I, Introduction to Computer Science, and Linear Algebra for Business.

University of Utah, Salt Lake City, UT.

Visiting Scholar, 2017.

University of Melbourne, Melbourne, Australia.

Visiting Researcher, 2016.

MIT Lincoln Laboratory, Lexington, MA.

Research Intern, 2014 – 2016.

Conference Papers

Reflexive Design for Fairness and Other Human Values in Formal Models. Benjamin Fish and Luke Stark. Conference on AI, Ethics, and Society (AIES 2021).

The Effect of Competition and Regulation on Error Inequality in Data-Driven Markets. Hadi Elzayn and Benjamin Fish. Conference on Fairness, Accountability, and Transparency (FAT* 2020).

Sampling Without Compromising Accuracy in Adaptive Data Analysis. Benjamin Fish, Lev Reyzin, and Benjamin I.P. Rubinstein. Algorithmic Learning Theory (ALT 2020).

Gaps in Information Access in Social Networks. Benjamin Fish, Ashkan Bashardoust, danah boyd, Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. The Web Conference (WWW 2019).

On the Complexity of Learning from Label Proportions. Benjamin Fish and Lev Reyzin. International Joint Conference on Artificial Intelligence (IJCAI 2017), superseded and expanded on by JAIR 2020 below.

Recovering Social Networks by Observing Votes. Benjamin Fish, Yi Huang, and Lev Reyzin. 2016 Autonomous Agents and Multiagent Systems International Conference (AAMAS 2016).

A Confidence-Based Approach for Balancing Fairness and Accuracy. Benjamin Fish, Jeremy Kun, and Ádám D. Lelkes. SIAM Intl. Conference on Data Mining (SDM 2016).

Handling Oversampling in Dynamic Networks Using Link Prediction. Benjamin Fish and Rajmonda S. Caceres. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML 2015).

On the Computational Complexity of MapReduce. Benjamin Fish, Jeremy Kun, Ádám D. Lelkes, Lev Reyzin, and György Turán. In Proceedings of the 29th International Symposium on Distributed Computing (DISC 2015).

CSPs and Connectedness: P/NP Dichotomy for Idempotent, Right Quasigroups. Benjamin Fish, Robert W. McGrail, James Belk, Solomon Garber, and Japheth Wood. 16th Intl. Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC 2014).

Feature selection based on mutual information for human activity recognition. Benjamin Fish, Ammar Khan, Nabil Hajj Chehade, Chieh Chien, and Greg Pottie. IEEE Intl. Conference on Acoustics, Speech and Signal Processing (ICASSP 2012).

Journal Papers

On the Complexity of Learning a Class Ratio from Unlabeled Data. Benjamin Fish and Lev Reyzin. Journal of Artificial Intelligence Research, Volume 69, 2020 (JAIR 2020).

Betweenness centrality profiles in trees. Benjamin Fish, Rahul Kushwaha, and György Turán. Journal of Complex Networks, Volume 5, Issue 5, October 2017 (JCN 2017).

Zero-sum Flows of the Linear Lattice. Ghassan Sarkis, Shahriar Shahriari, and the Pomona College Undergraduate Research Circle. Finite Fields and their Application, 2015.

Diamond Free Subsets in the Linear Lattices. Ghassan Sarkis, Shahriar Shahriari, and the Pomona College Undergraduate Research Circle. Order, 2013.

Workshop Papers

Sub-Linear Time Adaptive Data Analysis. Benjamin Fish, Lev Reyzin, and Benjamin I.P. Rubinstein. International Symposium on Artificial Intelligence and Mathematics (ISAIM 2018).

A task-driven approach to time scale detection in dynamic networks. Benjamin Fish and Rajmonda S. Caceres. Workshop on Mining and Learning with Graphs 2017 (at KDD 2017).

Open Problem: Meeting Times for Learning Random Automata. Benjamin Fish and Lev Reyzin. 2017 Conference on Learning Theory (COLT 2017).

Fair boosting: A case study. Benjamin Fish, Jeremy Kun, and Ádám D. Lelkes. ICML 2015 Workshop on Fairness, Accountability, and Transparency in Machine Learning (at ICML 2015).

Theses

New Models and Algorithms for Data Analysis. Advised by Lev Reyzin. Ph.D. Thesis, 2018.

The Word Problem in Quandles. Advised by Rena Levitt. B.A. Thesis, 2013.

The Cophylogeny Reconstruction Problem. Advised by Ran Libeskind-Hadas. B.A. Thesis, 2013.

Selected Honors and Awards

NSF EAPSI Fellowship, 2016.

Distinction in Mathematics Senior Exercise, Pomona College, 2013.

Harvey Mudd College Computer Science Department Wing and Ellen Tam Software Development Award, 2010.

Professional Activities

PC member (alternatively called a reviewer by some communities) for AAAI 2018, NeurIPS 2018, FAT* 2019, NeurIPS 2019, ICML 2019, IJCAI-AI4SG 2019, ISAIM 2020, ICML 2020, NeurIPS 2020, and IJCAI 2021 and reviewer for ICML 2016, COLT 2018, and RANDOM 2018.

Co-organizer of a CRAFT (workshop event) session at FAT* 2020 titled When Not to Design, Build, or Deploy.

Was the organizer of the Graduate Theoretical Computer Science Seminar at the University of Illinois at Chicago.

Has given invited talks at Cornell Tech, Google Research, Michigan State University, Princeton University, University of Melbourne, University of Pennsylvania, University of Utah, University of Victoria and others.