

Adam J. Fisch

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SUMMARY

I am a Ph.D. student working with Professors Regina Barzilay and Tommi Jaakkola in the Electrical Engineering and Computer Science department at MIT. My core interests are in developing methods for effective, efficient, and reliable machine learning. In particular, I work on efficient learning and inference algorithms for challenging and realistic scenarios where data or computational resources may be limited. At the same time, I also work on quantifying the inherent uncertainty of these methods with precise performance guarantees. Applications of my work include language modeling, machine reading of text for automatic question answering, lung cancer risk assessment, and in-silico screening for drug discovery.

EDUCATION

Massachusetts Institute of Technology (MIT)

Ph.D. in Electrical Engineering and Computer Science; GPA: 4.9/5.0

Cambridge, MA

Sep 2017 – May 2023 (exp.)

Concentration: Machine Learning; Uncertainty Estimation; Natural Language Processing (NLP)

Advisor: Regina Barzilay

Awards: National Science Foundation Graduate Research Fellowship Award

Princeton University

Bachelor of Science in Engineering; GPA: 3.89/4.0

Princeton, NJ

Sep 2011 – May 2015

Major: Mechanical Engineering

Thesis: MARVIN: Multimodally Advantaged Robotic Vehicle for Improved Navigation

Advisors: Clarence Rowley and Andrew Houck

Certificates: Applications of Computing; Robotics and Intelligent Systems

Honors: Summa Cum Laude; Phi Beta Kappa; Sigma Xi; Tau Beta Pi

Awards: Calvin Dodd MacCracken Senior Thesis Award; Donald Janssen Dike Award for Excellence in Undergraduate Research (1st place); John Marshall II Memorial Funding Award for Independent Work; Princeton Shapiro Prize for Academic Excellence

PUBLICATIONS (JOURNALS AND CONFERENCES)

- [Calibrated Selective Classification](#). **Adam Fisch**, Tommi Jaakkola, Regina Barzilay. In Transactions on Machine Learning Research (TMLR). 2022.
- [Confident Adaptive Language Modeling](#). Tal Schuster*, **Adam Fisch***, Jai Gupta, Mostafa Dehghani, Dara Bahri, Vinh Q. Tran, Yi Tay, Donald Metzler. In proceedings of NeurIPS. 2022.
- [Conformal Prediction Sets with Limited False Positives](#). **Adam Fisch**, Tal Schuster, Tommi Jaakkola, Regina Barzilay. In proceedings of ICML. 2022.
- [Making Pre-trained Language Models Better Few-shot Learners](#). Tianyu Gao*, **Adam Fisch***, Danqi Chen. In proceedings of ACL. 2021.
- [Consistent Accelerated Inference via Confident Adaptive Transformers](#). Tal Schuster*, **Adam Fisch***, Tommi Jaakkola, Regina Barzilay. In proceedings of EMNLP 2021.
- [Few-shot Conformal Prediction with Auxiliary Tasks](#). **Adam Fisch**, Tal Schuster, Tommi Jaakkola, Regina Barzilay. In proceedings of ICML. 2021.
- [Efficient Conformal Prediction via Cascaded Inference with Expanded Admission](#). **Adam Fisch***, Tal Schuster*, Tommi Jaakkola, Regina Barzilay. In proceedings of ICLR. 2021.
- [Get Your Vitamin C! Robust Fact Verification with Contrastive Evidence](#). Tal Schuster, **Adam Fisch**, Tommi Jaakkola, Regina Barzilay. In proceedings of NAACL. 2021.
- [CapWAP: Captioning with a Purpose](#). **Adam Fisch**, Kenton Lee, Ming-Wei Chang, Jonathan H. Clark, Regina Barzilay. In proceedings of EMNLP 2020.
- [MRQA 2019 Shared Task: Evaluating Generalization in Reading Comprehension](#). **Adam Fisch**, Alon Talmor, Robin Jia, Minjoon Seo, Eunsol Choi, Danqi Chen. In proceedings of the Machine Reading for Question Answering (MRQA) Workshop at EMNLP 2019.
- [Working Hard or Hardly Working: Challenges of Integrating Typology into Neural Dependency Parsers](#). **Adam Fisch***, Jiang Guo*, Regina Barzilay. In proceedings of EMNLP 2019.
- [Starspace: Embed All The Things!](#) Ledell Wu, **Adam Fisch**, Sumit Chopra, Keith Adams, Antoine Bordes, Jason Weston. In proceedings of AAAI. 2018.
- [ParIAI: A Dialog Research Software Platform](#). Alexander H. Miller, Will Feng, **Adam Fisch**, Jiasen Lu, Druv Batra, Antoine Bordes, Devi Parikh, and Jason Weston. In proceedings of EMNLP 2017.
- [Reading Wikipedia to Answer Open-Domain Questions](#). Danqi Chen, **Adam Fisch**, Jason Weston, Antoine Bordes. In proceedings of ACL. 2017.

- [Key-Value Memory Networks for Directly Reading Documents](#). Alexander H. Miller, **Adam Fisch**, Jesse Dodge, Amir-Hossein Karimi, Antoine Bordes, Jason Weston. In proceedings of EMNLP 2016.

PRE-PRINTS (IN SUBMISSION)

- [Conformal Risk Control](#). Anastasios N. Angelopoulos, Stephen Bates, **Adam Fisch**, Lihua Lei, Tal Schuster. ArXiv preprint. In submission to Annals of Statistics. 2022.
- [Efficiently Controlling Multiple Risks with Pareto Testing](#). Bracha Laufer-Goldshtein, **Adam Fisch**, Regina Barzilay, Tommi Jaakkola. ArXiv preprint. In submission to ICLR. 2022.

WORK EXPERIENCE

Research Scientist Intern

DeepMind (Host: Marc'Aurelio Ranzato)

London, UK

Jun 2022 – Oct 2022

- Continual learning for efficient large-scale natural language processing.

Research Assistant

MIT Computer Science and Artificial Intelligence Laboratory (MIT CSAIL)

Cambridge, MA

Sep 2017 – Present

- Ongoing research on uncertainty estimation; trust-worthy machine learning; efficient inference; few-shot learning.
- Published work in ACL, EMNLP, NAACL, ICML, ICLR, and AAAI conferences.

Assistant Instructor

MIT Professional Education

Cambridge, MA

Jan 2020 – Jun 2022

- Instructor for the Applied Deep Learning Boot Camp and Machine Learning for Big Data and Text Processing courses.
- Courses cover both machine learning fundamentals as well as applied tutorials (with PyTorch and SciKit-learn).

Research Scientist Intern

Google AI Language (Host: Kenton Lee)

Seattle, WA

Jun 2019 – Feb 2020

- Developed image captioning systems that satisfy information needs, using information-seeking QA pairs from real users.
- Published *CapWAP: Captioning with a Purpose* at EMNLP 2020, together with a public code release ([github](#)).

Teaching Assistant

MIT Department of Electrical Engineering and Computer Science (MIT EECS)

Cambridge, MA

Jan 2019 – Aug 2019

- *6.883 Modeling with machine learning: from algorithms to applications*. Taught guest lectures, created and graded exam and homework problems, conducted office hours, maintained the course website, and advised students on final projects.

Research Engineer

Facebook AI Research (FAIR)

New York, NY

Aug 2015 – Aug 2017

- Implemented algorithms for large-scale representation learning and personalized ranking.
- Researched novel neural methods for natural language processing and question answering.

Software Engineering Intern

Facebook (Host: Valentin Stanciu)

New York, NY

May 2014 – Aug 2014

- Worked for the Photos infrastructure team on enhancing privacy checks.

Research Intern

Princeton Dynamical Controls Systems Laboratory (Host: Professor Naomi Leonard)

Princeton, NJ

Jun 2013 – Aug 2013

- Researched biologically-inspired control laws (e.g., fish schooling) for coordinating autonomous groups of robots.

Research Intern

Princeton Environmental Institute (Hosts: Professors Howard Stone and Guy Nordenson)

Princeton, NJ

Jun 2012 – Aug 2012

- Researched the mechanics of storm surge from hurricanes, and its impact on coastal cities.

PROFESSIONAL SERVICE

- Co-organizer of the 2nd [Workshop on Machine Reading for Question Answering](#) (MRQA) at EMNLP 2019.
- Co-organizer of the 3rd [Workshop on Machine Reading for Question Answering](#) (MRQA) at EMNLP 2021.
- Co-instructor for the tutorial on [Uncertainty Estimation for Natural Language Processing](#) at COLING 2022.
- Reviewer for ACL, EMNLP, NAACL, AAAI, ICML, ICLR, NeurIPS, and AKBC conferences (2017-present).
- Reviewer for JMLR and JAIR journals (2021-present).

TECHNICAL SKILLS

- **Languages** : Python, Lua, Java, C, PHP, Bash, SQL, MATLAB, LaTeX.
- **Technologies** : MacOS, Linux, tmux, git, Mercurial.
- **Libraries** : PyTorch, Torch, Tensorflow, Transformers, Pytorch Lightning, Theano, NumPy, Scikit-Learn, Jupyter, Hive, Presto, SQLite.