

# Helen Zhou

Ph.D. Candidate in CMU Machine Learning Department

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## Education

<b>Carnegie Mellon University (CMU)</b>	Pittsburgh, PA
Ph.D. in Machine Learning (GPA: 4.1/4.0)	2018–2023
M.S. in Machine Learning Research (GPA: 4.1/4.0)	2018–2021
<b>Massachusetts Institute of Technology (MIT)</b>	Cambridge, MA
M.Eng. in Computer Science & Electrical Engineering (GPA: 5.0/5.0)	2017–2018
B.S. in Computer Science & Electrical Engineering (GPA: 4.9/5.0)	

## Academic & Industry Research Experience

Present Sept 2018	<b>Ph.D. Student, Machine Learning Department, CMU</b> <i>Advisor: Prof. Zachary Lipton</i> <ul style="list-style-type: none"><li>• Research at the intersection of machine learning and healthcare</li><li>• Develop methods for forecasting, handling distribution shift, and risk prediction, on modalities including tabular data, images, and time series</li><li>• Collaborate with Allegheny Health Network to develop and deploy COVID-19 risk models</li></ul>
Mar 2023 May 2022	<b>Ph.D. Research Intern and Student Researcher, Google Cloud AI Discovery</b> <i>Advisor: Prof. Jingtao Wang and Dr. Sercan Arik</i> <ul style="list-style-type: none"><li>• Develop forecasting models to optimize directly for downstream business metrics end-to-end</li></ul>
Jan 2020 May 2019	<b>Ph.D. Research Intern and Student Researcher, Medical Brain, Google Health</b> <i>Advisors: Dr. Andrew Dai, Dr. Yuan Xue</i> <ul style="list-style-type: none"><li>• Explore neural ordinary differential equation models for patient trajectory modeling</li></ul>
Aug 2018 Sept 2017	<b>M.Eng. Research Student, Clinical Machine Learning Group, MIT</b> <i>Advisor: Prof. David Sontag</i> <ul style="list-style-type: none"><li>• <u><a href="#">Thesis: Large-scale Prediction of Patient-Level Antibiotic Resistance: Towards Clinical Decision Support for Improved Antimicrobial Stewardship (Masterworks video)(MIT News)</a></u></li></ul>
Sept 2017 June 2017	<b>Research Intern, Digital Relevance Ranking Team, Amazon Search (A9)</b> <i>Advisor: Dr. Vamsi Salaka</i> <ul style="list-style-type: none"><li>• Created a universal ranking model and review summarization feature using topic-modeling</li></ul>
Aug 2017 Oct 2015	<b>Independent Research Collaboration, Fluid Interfaces Group, MIT</b> <i>Advisor: Prof. Pattie Maes</i> <ul style="list-style-type: none"><li>• Performed appearance-based gaze estimation using deep learning for low-cost VR settings</li></ul>
May 2017 Jan 2014	<b>Undergraduate Research Student, Laboratory for Social Machines, MIT</b> <i>Advisor: Prof. Deb Roy</i> <ul style="list-style-type: none"><li>• Developed and implemented machine learning models for characterizing food purchase behavior, linking profiles across platforms, and contextual text sentiment classification</li></ul>

## Other Industry Experience

Sept 2016	<b>Software Engineering Intern, Google Daydream</b>
May 2016	Created and integrated firmware update library and UI for VR headset controller
Feb 2016	<b>Software Engineering Intern, Brain Power LLC.</b>
Jan 2016	Designed and implemented various computer vision, game, and analytical features for the company's main product: Google Glass tailored to help kids with autism
Aug 2015	<b>Software Engineering Intern, Google Fiber</b>
May 2015	Created an extensible Django website for visualization & analysis of Wi-Fi tests

## Publications & Talks

1. H Zhou, S Arik, J Wang. Business Metric-Aware Forecasting: A Case Study in Inventory. *Under Submission*.
2. H Zhou, S Balakrishnan, ZC Lipton. Domain Adaptation Under Missingness Shift. *AISTATS 2023*.
3. H Zhou\*, Y Chen\*, ZC Lipton. Model Evaluation in Medical Datasets Over Time. *Machine Learning for Healthcare Symposium 2022 Extended Abstract*.
4. H Zhou, C Cheng, KJ Shields, G Kochhar, T Cheema, ZC Lipton, JC Weiss. Learning Clinical Concepts for Predicting Risk of Progression to Severe COVID-19. Presented at *AMIA Annual Symposium 2022*.
5. H Zhou, KJ Shields, C Cheng, G Kochhar, T Cheema, ZC Lipton, JC Weiss. Predicting Risk of Progression to Severe COVID-19 in Southwestern Pennsylvania: A Two-Year Journey. *AMIA Clinical Info. Conference 2022*.
6. H Zhou\*, MA Abdelgadir\*, J Byrd\*, YM Kelly, L Hall, H Jones, JF Pingpank, ZC Lipton, DL Bartlett, HM Choudry. Predictive Modeling of Severe Complications from Cytoreductive Surgery with Hyperthermic Intraperitoneal Chemotherapy: A Data-Driven, Machine Learning Approach to Augment Clinical Judgement. To appear in *Annals of Surgical Oncology*.
7. H Zhou\*, J Kim\*, ZC Lipton. Do You See What I See? Do You See What I See? A Comparison of Radiologist Eye Gaze to Computer Vision Saliency Maps for Chest X-ray Classification. In *proceedings of International Conference on Machine Learning 2021 workshop on Interpretable Machine Learning for Healthcare*.
8. H Zhou\*, C Cheng\*, ZC Lipton, GH Chen, JC Weiss. Predicting Mortality Risk in Viral and Unspecified Pneumonia to Assist Clinicians with COVID-19 ECMO Planning. In *proceedings of 18th International Conference on Artificial Intelligence in Medicine, AIME 2020*.
9. H Zhou\*, C Cheng\*, JC Weiss, ZC Lipton. Unpacking the Drop in COVID-19 Case Fatality Rates: A Study of National and Florida Line-Level Data. In *proceedings of AMIA Annual Symposium 2021. Top 8 student papers*.
10. H Zhou, Y Xue, A Dai. "Neural Interventional GRU-ODEs." *BayLearn 2020: Bay Area ML Symposium*.
11. S Boominathan, M Oberst, H Zhou, S Kanjilal, D Sontag. "Treatment Policy Learning in Multiobjective Settings with Fully Observed Outcomes." *Knowledge Discovery and Data Mining Conference, KDD 2020*.
12. S Kanjilal, M Oberst, S Boominathan, H Zhou, DC Hooper, D Sontag. "A decision algorithm to promote outpatient antimicrobial stewardship for uncomplicated urinary tract infection." *Science Translational Medicine 2020*
13. H Zhou, S Kanjilal, D Sontag. "Large-Scale Prediction of Patient-Level Antibiotic Resistance: Towards Clinical Decision Support for Improved Antimicrobial Stewardship." 2018 MIT M.Eng. Thesis.
14. S Vosoughi, H Zhou, D Roy. "Enhanced Twitter Sentiment Classification Using Contextual Information." In *proceedings of EMNLP 2015 workshop on Approaches to Subjectivity, Sentiment & Social Media Analysis*.
15. S Vosoughi, H Zhou, D Roy. "Digital Stylography: Linking Profiles Across Social Networks." In *proceedings of 2015 International Conference on Social Informatics*. Also in *Lecture Notes in Computer Science* book series.
16. H Zhou, D Roy, S Vosoughi. "Analyzing & Understanding Food Networks." 2016 EECScn conference.
17. H Zhou, D Mayo, S Greenwald. "Siamese Convolutional Neural Networks for Appearance-Based Gaze Estimation." Talk at the 2017 European Conference on Eye Movements. Wuppertal, Germany.

## Selected Honors & Awards

2019–Present	National Science Foundation Graduate Research Fellowship
2020–2021	Machine Learning Department TA Award
2019–2021	Paul and Daisy Soros Fellow
2016–2018	MIT Eta Kappa Nu (HKN)
2016–2018	Tau Beta Pi (TBP) Honor Society
2017–2017	1st place in Amazon Search hackathon, idea now implemented in amazon.com
2015–2017	MIT SuperUROP Scholar
2014–2015	MIT Society of Women Engineers Scholarship Recipient

## Leadership & Service

Machine Learning for Healthcare (ML4H) Symposium Organizer (2022, 2023)  
CMU School of Computer Science Dean's PhD Advisory Committee (2020–Present)  
CMU Machine Learning Department Doctoral Review Committee (2020–Present)  
CMU Machine Learning PhD (2018–2019) Admissions Committee  
CMU Machine Learning Masters (2019–2020) Admissions Committee  
MIT Eta Kappa Nu Tutoring Chair (2017–2018)  
MIT Eta Kappa Nu Internal Relations Chair (2016–2017)  
MIT IEEE Undergraduate Research & Technology Conference Chair (2015–2016)  
MIT IEEE Undergraduate Research & Technology Conference Webmaster (2014–2015)

## Teaching

Probabilistic Graphical Models TA (10-708, Spring 2021)  
Probabilistic Graphical Models TA (10-708, Fall 2021)  
Introduction to Machine Learning TA (6.036, Spring 2017)  
Introduction to Machine Learning TA (6.036, Fall 2017)  
Introduction to EECS II head grader (6.02, Fall 2016)  
Algorithms & Math for Computer Science HKN Tutor (6.006, 6.046, 6.042, Fall 2014 - Spring 2016)  
Introduction Deep Learning TA (6.S191, Winter 2017)  
Computational Structures LA (6.004, Spring 2016)  
Multivariate Calculus TA (18.02, Fall 2014)  
Introduction to EECS LA (6.01, Fall 2014)

## Mentorship

Yuwen Chen (MS, Spring 2022—Spring 2023, now Duke PhD)  
Jesse Kim (MS, Spring 2021—Fall 2021, now Staff Data Scientist at Palo Alto Networks)  
Jamin Chen (MS, Spring 2021, now ML Research Engineer at Genesis Therapeutics)

## Skills

Programming Languages: Python, Java, R, MATLAB, Javascript, C#, Swift, C++  
Machine Learning Libraries: PyTorch, TensorFlow, Keras, Scikit-learn, SciPy, NumPy  
Other Frameworks: ROS, OpenCV, Android Studio, Unity, SolidWorks, Django, React  
Miscellaneous: Linux, long-distance running, drawing, piano, clarinet