Michael Hu

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Education

Princeton University Fall 2017 – Spring 2021
Bachelor of Science in Engineering (BSE), Computer Science Princeton, NJ

- Minors: Statistics and Machine Learning, Robotics and Intelligent Systems
- GPA: 3.89 / 4
- Coursework: *Theoretical Machine Learning, *Deep Learning for Natural Language Processing, Robotics, Models of Cognition, Advanced Algorithms, Differential Equations, Analysis, Probability, Computer Networks

* indicates graduate level course

Selected Research

Meta Learning, Knowledge Distillation, and Language Fall 2020 – Present
Senior Thesis. Advisors: Tom Griffiths, Karthik Narasimhan Princeton, NJ

- Conceiving new ways to extract knowledge from deep learning models.

Safe Reinforcement Learning with Natural Language Constraints Spring, Summer 2020
Junior Independent Work. Advisor: Karthik Narasimhan Princeton, NJ

- Created a new safe reinforcement learning task and environment, where safety constraints are specified in natural language. Designed a baseline agent that navigates our environment while obeying constraints.

Accelerating Entropy-Based Transformer Calibration Fall 2019
Junior Independent Work. Advisor: Karthik Narasimhan Princeton, NJ

- Calibrated GPT-2, a neural language model, to produce text more entropically consistent with natural language. Constructed and implemented new approximation algorithms to reduce GPT-2 calibration costs.

rRNA Expansion in Eukaryotes: from Signature Folds to Tentacles 2015 – 2018
Research Assistant. Advisors: Anton Petrov, Loren Dean Williams Atlanta, GA

- Visualized and mapped the ribosomal structures of 20+ species in silico, alleviating the need for expensive X-ray crystallography. Results published in *Journal of Molecular Biology* and *Biochemistry.* Paper under review.

Employment

Roblox, Trust and Safety Team Summer 2019
Software Engineering Intern San Mateo, CA

- Trained BERT, a deep learning model, to identify bad actors in the Roblox community. Automated the labeling of training data for BERT using Snorkel, a data programming package.
- Decreased average response time of a platform-wide content filter by 3x through a simplified caching layer. Onboarded 5 engineers to the code base. Code is still in use today and handles 15k+ queries per second.

BatteryPOP / Princeton Startup Immersion Program Summer 2019
Software Engineering Intern New York, NY

- Co-developed yaasgames.com, an HTML5 games website. Enabled ad revenue generation by adding spots for banner and video ads. Populated yaasgames.com with 100+ games, in close collaboration with the CEO.

Honors and Awards

Princeton Center for Statistics and Machine Learning Summer Research Award 2020

- Awarded to 3 Princeton undergraduates.

Princeton Engineering Project X Summer Research Award (declined) 2020

Mary George Freshman Research Conference 2018

- Awarded to 17 Princeton freshmen. Selection based on final papers from class-wide writing course.

Service

Peer Academic Advisor Fall 2019 – Present

- Advise freshmen and sophomores on academics, extracurriculars, and career.
- Offer emotional support, especially during stressful times in the academic year.

Undergraduate Teaching Assistant

- Computer Networks (COS 461) Fall 2020
- Introduction to Machine Learning (COS 324) Spring 2020
- Discrete Math (COS 340). Served as **Head TA** for Fall 2019. Fall, Spring 2019

Activities

Princeton Association for Computing Machinery Fall 2017 – Present

Club Ambassador (2018), Careers Chair (2019)

- Increased club membership by 50% through outreach to other computer science interest groups
- Hosted a series of tech career discussion panels attended by 100+ students (~1.5% of the school)

Disci May 2018 – March 2019

Personal Project

- Built Disci, a virtual card game that teaches chemistry to high school students. Defined Disci's architecture and game design. Collaborated with 2 fellow Princeton students. Deployed card game to 30 alpha testers.

Publications

* indicates equal contribution

Yang, Tsung-Yen*, **Michael Hu***, Yinlam Chow, Peter J. Ramadge, and Karthik Narasimhan. "Safe Reinforcement Learning with Natural Language Constraints." *NeurIPS 2020, Deep Reinforcement Learning Workshop*. http://arxiv.org/abs/2010.05150.

(under review) Biesiada, Marcin, **Michael Hu**, Loren Dean Williams*, Katarzyna J. Purzycka*, and Anton S. Petrov*. "rRNA Expansion in Eukaryotes: from Signature Folds to Tentacles."

Mestre-Fos, Santi, Petar I. Penev, Suttipong Suttapitugsakul, **Michael Hu**, Chieri Ito, Anton S. Petrov, Roger M. Wartell, Ronghu Wu, and Loren Dean Williams. "G-Quadruplexes in Human Ribosomal Rna." *Journal of Molecular Biology* 431, no. 10 (May 2019): 1940–55.

Wang, Kai, Anthony K. Guzman, Zi Yan, Shouping Zhang, **Michael Y. Hu**, Mehdi B. Hamaneh, Yi-Kuo Yu, et al. "Ultra-High-Frequency Reprogramming of Individual Long-Term Hematopoietic Stem Cells Yields Low Somatic Variant Induced Pluripotent Stem Cells." *Cell Reports* 26, no. 10 (March 2019): 2580-2592.e7.

Gómez Ramos, Lizzette M., Natalya N. Degtyareva, Nicholas A. Kovacs, Stefany Y. Holguin, Liuwei Jiang, Anton S. Petrov, Marcin Biesiada, **Michael Y. Hu**, Katarzyna J. Purzycka, Dev P. Arya, Loren Dean Williams. "Eukaryotic Ribosomal Expansion Segments as Antimicrobial Targets." *Biochemistry* 56, no. 40 (October 10, 2017): 5288–99.

Skills

Programming Languages

- Proficient with Python, JavaScript, and Go.
- Familiar with R, Java, C#, C, SQL, HTML, CSS, and PHP.

Data Science: PyTorch, TensorFlow, NumPy, AWS, Mechanical Turk, CUDA.
Web Development: WordPress, Node.js, .NET Core, REST API, Heroku, Docker, Container Orchestration.

Hobbies

Breakdancing, journaling, cooking, finding good music on YouTube