

# Yutong Wang

Eric and Wendy Schmidt AI in Science Postdoctoral Fellow  
Electrical Engineering and Computer Science, University of Michigan  
📍 1301 Beal Avenue, Ann Arbor, MI, USA, 48109-2122  
🌐 [web.eecs.umich.edu/~yutongw/](http://web.eecs.umich.edu/~yutongw/)  
✉ [yutongw@umich.edu](mailto:yutongw@umich.edu)  
Citizenship: USA

## Research Interests

---

Theory of overparametrized learning. Exactly or nearly interpolating models. Phenomena in multiclass classification. Efficient machine learning (ML) via compression. ML for science: genomics, spectroscopy, and ecology.

## Professional Experience

---

<b>Eric and Wendy Schmidt AI in Science Postdoctoral Fellow</b>	Jan 2023 - Present
University of Michigan, Ann Arbor	
<b>Postdoctoral Research Fellow</b>	Sep 2022 - Jan 2023
University of Michigan, Ann Arbor	

## Education

---

<b>PhD, Electrical &amp; Computer Engineering</b>	Sep 2016 - Aug 2022
University of Michigan, Ann Arbor	
Thesis: <i>Classification via Multiple Hyperplanes: Loss functions, Overparametrization, and Interpolation</i> . <a href="#">[Link]</a>	
Advisor: Prof. Clayton Scott	
<b>MA, Mathematics</b>	Sep 2014 - Jun 2016
University of California, Davis	
<b>BSE, Electrical Engineering (Minor in Mathematics)</b>	Sep 2010 - Apr 2014
University of Michigan, Ann Arbor	

## Preprints

---

- [1] **Yutong Wang** and Clayton Scott. “Unifying Binary and Multiclass Margin-Based Classification”. [\[arXiv\]](#), Submitted to *Journal of Machine Learning Research*. 2023.
- [2] Pengyu Li\*, **Yutong Wang\***, Xiao Li, and Qing Qu. “Neural Collapse in Multi-label Learning with Pick-all-label Loss”. [\[arXiv\]](#), Submitted to *International Conference on Learning Representations*. 2024.
- [3] **Yutong Wang**, Rishi Sonthalia, and Wei Hu. “Near-Interpolators: Rapid Norm Growth and the Trade-Off between Interpolation and Generalization”. Accepted to *NeurIPS 2023 Workshop Mathematics of Modern Machine Learning (M3L)*. Submitted to *International Conference on Artificial Intelligence and Statistics*. 2024.
- [4] Zhiwei Xu, **Wang, Yutong**, Spencer Frei, Gal Vardi, and Wei Hu. “Benign Overfitting and Grokking in ReLU Networks for XOR Cluster Data”. [\[arXiv\]](#). Accepted to *NeurIPS 2023 Workshop Mathematics of Modern Machine Learning (M3L)*. Submitted to *International Conference on Learning Representations*. 2024.
- [5] Jiyi Chen, Pengyu Li, **Wang, Yutong**, Pei-Cheng Ku, and Qing Qu. “Accelerating Deep Learning in Reconstructive Spectroscopy with Device-Informed Data Simulation”. Submitted to *International Conference on Acoustics, Speech, and Signal Processing*. 2024.

- [6] James Boyko, Nathan Fox, **Wang, Yutong**, Yiluan Song, and Yu Zhou. “Monitoring Plant-Pollinator Networks by Integrating Museum Data, Citizen Science and Computer Vision”. In preparation. Poster at *2023 U-M Data Science and AI Summit*.
- [7] Joseph Cohen, Andreas Rauch, Jennifer Li, Bernardo Modenesi, James Boyko, **Wang, Yutong**, Eunshin Byon, and Xun Huan. “Sparse Modeling of Wavelet Features for Fault Classification and Regression in Spacecraft Propulsion Systems”. In preparation. Poster at *Asia Pacific Conference of the Prognostics and Health Management Society 2023*.

\* denotes equal contribution.

## Publications

---

- [8] **Yutong Wang** and Clayton Scott. “On Classification-Calibration of Gamma-Phi Losses”. In: *Conference on Learning Theory*. [\[Link\]](#). 2023.
- [9] **Yutong Wang** and Clayton Scott. “Consistent Interpolating Ensembles via the Manifold-Hilbert Kernel”. In: *Neural Information Processing Systems*. [\[Link\]](#). 2022.
- [10] **Yutong Wang** Jianxin Zhang and Clayton Scott. “Learning from Label Proportions by Learning with Label Noise”. In: *Neural Information Processing Systems*. [\[Link\]](#). 2022.
- [11] **Yutong Wang** and Clayton Scott. “VC dimension of partially quantized neural networks in the over-parametrized regime”. In: *International Conference on Learning Representations*. [\[Link\]](#). 2022.
- [12] **Yutong Wang** and Clayton Scott. “An exact solver for the Weston-Watkins SVM subproblem”. In: *International Conference on Machine Learning*. [\[Link\]](#). 2021.
- [13] **Yutong Wang** and Clayton Scott. “Weston-Watkins Hinge Loss and Ordered Partitions”. In: *Neural Information Processing Systems*. [\[Link\]](#). 2020.
- [14] Tasha Thong, **Yutong Wang**, Michael Brooks, Christopher Lee, Clayton Scott, Laura Balzano, Max Wicha, and Justin Colacino. “Hybrid stem cell states: insights into the relationship between mammary development and breast cancer using single-cell transcriptomics”. In: *Frontiers in Cell and Developmental Biology* 8 (2020). [\[Link\]](#), p. 288.

## Technical Reports

---

- [15] **Wang, Yutong**, Tasha Thong, Venkatesh Saligrama, Justin Colacino, Laura Balzano, and Clayton Scott. “A gene filter for comparative analysis of single-cell RNA-sequencing trajectory datasets”. [\[bioRxiv\]](#). 2019.

## Grants

---

**NSF CISE Medium, Award # 2312842** 2023  
*Collaborative Research: RI: Medium: Principles for Optimization, Generalization, and Transferability via Deep Neural Collapse,*

Budget: \$1,200,000, Period Covered: 10/01/2023 - 09/30/2026

PI: Zhihui Zhu, Co-PI: Jeremias Sulam, Co-PI: Qing Qu, Senior Personnel: **Yutong Wang**

**Schmidt Futures AI Collaboration Fund, Submitted** 2023  
*Biodiversity Monitoring of Plant-Pollinator Networks via Efficient Computer Vision,*

Budget: \$25,000

PI: **Yutong Wang**, Co-PI: James Boyko, Co-PI: Nathan Fox, Co-PI: Yiluan Song, Co-PI: Yu Zhou

## Presentations

---

**Benign Overfitting and Grokking in ReLU Networks for XOR Cluster Data**

The Interplay between Learning, Optimization, and Statistics, 2023 INFORMS Annual Meeting.

John Wright's group meeting (Sept 2023)

**Closed-form Solutions of Learning Dynamics for Two-layer Nets for Collapsed Orthogonal Data**  
Third Workshop on Seeking Low-Dimensionality in Deep Neural Networks (SLOWDNN). [[Link](#)]

### **Consistent Interpolating Ensembles**

Workshop on the Theory of Overparameterized Machine Learning (TOPML 2022). [[Link](#)]

AI seminars at Boston University (Mar 2022).

Misha Belkin's group meeting (Jan 2022).

### **Weston-Watkins Hinge Loss and Ordered Partitions**

RIKEN seminar on Learning theory of loss functions (Nov 2021)

MCAIM Graduate Seminar, University of Michigan (Oct 2020)

### **Domain adaptation for spatial and dissociated gene expression data**

Learning Meaningful Representations of Life (LMRL) Workshop at NeurIPS. [[Link](#)]

## **Awards and Honors**

---

UM Postdoctoral Association Conference Award	2023
NeurIPS Scholar Award	2022
Honorable Mention for Outstanding Graduate Student Instructors and Instructional Aides	2021
NIH-sponsored travel award for NeurIPS Conference workshop NeurIPS 2019 Conference workshop: "Learning Meaningful Representations of Life"	2019
The Rollin M. Gerstacker Foundation Fellowship	2016
Dean's List	7 times
University Honors	4 times

## **Teaching Experience**

---

**Group leader** Summer 2023

Midwest Research Experience for Graduates [[link](#)]

Advised four PhD students early in their programs on machine learning research over the course of two weeks.

**Group leader assistant** Summer 2022

Michigan Research Experience for Graduates [[link](#)]

Advised five PhD students early in their programs on machine learning research over the course of two weeks.

**Graduate student instructor** Winter 2021

University of Michigan, Ann Arbor, EECS 598 Statistical Learning Theory

Received ECE GSI Honorable Mention for my teaching efforts.

### **Guest lecturer**

Fall 2021

University of Michigan, Ann Arbor, SW 508 Essentials of Social Welfare Policy

Lecture topic: Fairness in machine learning and its impact on social policy. Course instructor: Rita Xiaochen Hu.

### **Teaching assistant**

Winter 2015 - Spring 2016

University of California, Davis

Courses taught: MAT 21C Calculus: Partial Derivatives and Series, Winter 2015, Fall 2015, Winter 2016, and Winter 2016. MAT 21D Vector Analysis, Fall 2014, and Spring 2016.

## **Professional Services**

---

### **Reviewer (conferences)**

Conference on Learning Theory (COLT) 2023

Neural Information Processing Systems (NeurIPS) 2023

International Conference on Learning Representations (ICLR) 2023 Workshop on Domain Generalization

International Conference on Machine Learning (ICML) 2020

### **Reviewer (journals)**

Proceedings of the National Academy of Sciences (PNAS) of the United States of America

IEEE Transactions on Signal Processing

Journal of Machine Learning Research (JMLR)

### **Curriculum Committee Member**

Helped with the development of instructional materials for future cohorts of Schmidt AI in Science postdocs

### **Co-organizer for AI in Science & Engineering Day** [link](#)

Responsibilities include developing agenda and inviting speakers

### **Judge** for Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS) 2023. [link](#)

### **Group leader** for NeurIPS 2022 High School Outreach Program at New Orleans. [link](#)

### **Tutor at STEM Café at Women's Resources and Research Center, UC Davis**

2015-2016

Volunteered as a tutor in calculus, probability and combinatorics.

## **Community Service**

---

### **Volunteer for Ann Arbor Meals on Wheels**

2022-2023

Once a week meal delivery for older adults in Ann Arbor.

## **References**

---

- Qing Qu, [qingqu@umich.edu](mailto:qingqu@umich.edu)
- Wei Hu, [vvh@umich.edu](mailto:vvh@umich.edu)
- Clayton Scott, [clayscot@umich.edu](mailto:clayscot@umich.edu)
- Rafael Frongillo, [raf@colorado.edu](mailto:raf@colorado.edu)