

# Ziqiao Wang

## Curriculum Vitae

✉ [zwang286@uottawa.ca](mailto:zwang286@uottawa.ca)  
📄 <https://ziqiaowanggeothe.github.io>

### Education

- 2019–present **Ph.D, University of Ottawa, Ottawa, Ontario, Canada**, (Expected Dec. 2023).  
Electrical and Computer Engineering  
Thesis: “Exploring Generalization in Machine Learning through Information-Theoretic Lens”  
Advisor: Prof. Yongyi Mao
- 2017–2018 **M.A.Sc, University of Ottawa, Ottawa, Ontario, Canada**.  
Electrical and Computer Engineering  
Advisor: Prof. Yongyi Mao
- 2013–2017 **B.Eng, North China Electric Power University (NCEPU), Baoding, Hebei, China**.  
Electrical Engineering and its Automation  
Advisor: Prof. Xiangyu Zhang

### Research Interests

- **Area:** Machine Learning, Statistical Learning Theory, Information Theory
- **Topics:** Generalization in Machine Learning/Deep Learning, Domain Adaptation

### Employment

- May 2019 - **National Research Council Canada (NRC), Ottawa, Canada**.  
Dec. 2019 Research Intern at Digital Technologies Research Centre  
Mentor: Dr. Harry H.Y. Guo
- Jul. 2017 - **Tsintergy Technology Co., Ltd., Beijing, China**.  
Aug. 2017 Intern of Electricity Market and Energy Internet

### Publications & Preprints

\* denotes equal contribution.

- Conference C1 **Ziqiao Wang** and Yongyi Mao. “Tighter Information-Theoretic Generalization Bounds from Supersamples.” *International Conference on Machine Learning (ICML), 2023 (Oral Presentation, top 2.5% of submissions)*.
- C2 Zixuan Liu\*, **Ziqiao Wang**\*, Hongyu Guo and Yongyi Mao. “Over-Training with Mixup May Hurt Generalization.” *International Conference on Learning Representations (ICLR), 2023*.
- C3 **Ziqiao Wang** and Yongyi Mao. “Information-Theoretic Analysis of Unsupervised Domain Adaptation.” *International Conference on Learning Representations (ICLR), 2023*.
- C4 **Ziqiao Wang** and Yongyi Mao. “On the Generalization of Models Trained with SGD: Information-Theoretic Bounds and Implications.” *International Conference on Learning Representations (ICLR), 2022*.
- Workshop W1 Zixuan Liu\*, **Ziqiao Wang**\*, Hongyu Guo and Yongyi Mao. “Over-Training with Mixup May Hurt Generalization.” *First Workshop on Interpolation Regularizers and Beyond at NeurIPS 2022*.

- Preprints P1 **Ziqiao Wang** and Yongyi Mao. "Sample-Conditioned Hypothesis Stability Sharpens Information-Theoretic Generalization Bounds." *Submitted to NeurIPS 2023*.
- P2 **Ziqiao Wang** and Yongyi Mao. " $f$ -Divergence Guided Unsupervised Domain Adaptation: Two Theoretic Viewpoints." *In Submission*.
- P3 **Ziqiao Wang** and Yongyi Mao. "Two Facets of SDE Under an Information-Theoretic Lens: Generalization of SGD via Training Trajectories and via Terminal States." *In Submission*.
- P4 **Ziqiao Wang**, Yongyi Mao, Hongyu Guo and Richong Zhang. "On SkipGram Word Embedding Models with Negative Sampling: Unified Framework and Impact of Noise Distributions." *arXiv preprint arXiv:2009.04413, 2020*.

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## Honors & Awards

- 2023 ICLR Travel Award (1,000 USD)
- 2022-now INTER-MATH-AI Fellowship from the NSERC CREATE program (20,000 CAD/Year)
- 2021-now Doctorate Admission Scholarship from University of Ottawa (9,000 CAD/Year)
- 2019-now International Doctoral Scholarship from University of Ottawa (10,488 CAD/Year)
- 2016 Merit Student of NCEPU
- First-class Scholarship from NCEPU (3,000 RMB)
- First Prize of The Electrician Mathematical Contest in Modeling (EMCM)
- Meritorious Winner of 2016 Interdisciplinary Contest in Modeling (ICM)
- 2015 Meritorious Winner of 2015 Mathematical Contest in Modeling (MCM)
- Second Prize of China Undergraduate Mathematical Contest in Modeling (CUMCM)

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## Selected Talks

- 2023 **Over-Training with Mixup May Hurt Generalization.**
- "AI4D: The Science" seminar at National Research Council Canada, *Virtual, Apr. 2023*
- Information-Theoretic Analysis of Unsupervised Domain Adaptation.**
- Machine Learning Seminar at Department of Mathematics and Statistics, *University of Ottawa, Jan. 2023*
- 2021-2022 **On the Generalization of Models Trained with SGD: Information-Theoretic Bounds and Implications.**
- Prof. Yong Liu's Group (Gaoling School of Artificial Intelligence, Remin University of China), *Virtual, Jul. 2022*
  - AI TIME (Department of Computer Science and Technology, Tsinghua University), *Virtual, Jun. 2022*
  - "AI4D: The Science" seminar at National Research Council Canada, *Virtual, Dec. 2021*
- 2019 **On SkipGram Word Embedding Models with Negative Sampling: Unified Framework and Impact of Noise Distributions.**
- The Text Analysis and Machine Learning (TAMALE) seminar, *University of Ottawa, Nov. 2019*

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## Professional Service

**Conference Reviewer:** NeurIPS, ICML

**Journal Reviewer:** IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)

**Program Committee:** The 2024 IEEE North American School of Information Theory (NASIT)

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## Teaching Experience

2018– 2022 **Teaching Assistant**, *University of Ottawa*.

CSI 5138/5340[R00] Introduction to Deep Learning and Reinforcement Learning (2018-2019, 2021-2022)

ELG 5170[A00] Information Theory (2020)

GNG 1106[A00] Fundamentals of Engineering Computation (2020-2021)