

# Weihaio GAO

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## CONTACT INFORMATION

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## EDUCATION

**University of Illinois at Urbana-Champaign** August, 2019  
*Ph.D. in Electrical and Computer Engineering*

- Advisors: Sewoong Oh, Pramod Viswanath.
- Dissertation: “Information Theory meets Big Data: Theory, Algorithms and Applications to Deep Learning”.

**University of Illinois at Urbana-Champaign** December, 2016  
*M.S. in Electrical and Computer Engineering*

**Tsinghua University** July, 2014  
*B.E. in Computer Science and Technology (Yao Class)*

## EXPERIENCES

**Bytedance Inc.**, Bellevue, WA, USA September, 2019 - present  
*Research Scientist*

**Coordinates Science Lab**, Urbana, IL, USA August, 2014 - August, 2019  
*Research Assistant*

**Google Brain**, Kirkland, WA, USA January - May, 2019  
*Student Researcher*

**Google AI China Center**, Beijing, China June - September, 2018  
*Software Engineering Intern in Research*

**Facebook Inc.**, Menlo Park, CA, USA May - August, 2017  
*Software Engineering Intern*

**Institute for Quantum Computing**, Waterloo, ON, Canada June - September, 2013  
*Research Assistant*

## JOURNAL PUBLICATIONS

1. **W. Gao**, S. Oh, P. Viswanath, “Demystifying Fixed  $k$ -Nearest Neighbor Information Estimators”, *IEEE Transactions on Information Theory*, Vol.64, Issue:8, pp.5629-5661, September 2018.
2. **W. Gao**, S. Oh, P. Viswanath, “Breaking the Bandwidth Barrier: Geometrical Adaptive Entropy Estimation”, *IEEE Transactions on Information Theory*, Vol.64, Issue:5, pp.3313-3330, May 2018.
3. H. Kim, **W. Gao**, S. Kannan, S. Oh, P. Viswanath, “Discovering Potential Correlations via Hypercontractivity”, *Entropy*, Vol.19, Issue:11, pp:586, October 2017.

## CONFERENCE PUBLICATIONS

1. Y. Bu, **W. Gao**, S. Zou, V. V. Veeravalli, “Information-Theoretic Understanding of Population Risk Improvement with Model Compression”, under review, <https://arxiv.org/abs/1901.09421>.
2. **W. Gao**, Y.-H. Liu, C. Wang, S. Oh, “Rate Distortion For Model Compression: From Theory To Practice”, *International Conference on Machine Learning (ICML)*, Long Beach, CA, USA, 2019.
3. **W. Gao**, A. V. Makkuva, S. Oh, P. Viswanath, “Learning One-hidden-layer Neural Networks under General Input Distributions”, *International Conference on Artificial Intelligence and Statistics(AISTATS)*, Naha, Okinawa, Japan, 2019.

4. J. Jiao, **W. Gao**, Y. Han, “The Nearest Neighbor Information Estimator is Adaptively Near Minimax Rate-Optimal”, *Neural Information Processing Systems (NeurIPS)*, Montréal, QC, Canada, 2018, **spotlight presentation**.
5. **W. Gao**, S. Kannan, S. Oh, P. Viswanath, “Estimating Mutual Information for Discrete Continuous Mixtures”, *Neural Information Processing Systems (NeurIPS)*, Long Beach, CA, USA, 2017, **spotlight presentation**.
6. H. Kim, **W. Gao**, S. Kannan, S. Oh, P. Viswanath, “Discovering Potential Influence via Information Bottleneck”, *Neural Information Processing Systems (NeurIPS)*, Long Beach, CA, USA, 2017.
7. **W. Gao**, S. Oh, P. Viswanath, “Density Functional Estimators with  $k$ -Nearest Neighbor Bandwidths”, *International Symposium on Information Theory (ISIT)*, Aachen, Germany, 2017.
8. **W. Gao**, S. Oh, P. Viswanath. “Demystifying Fixed  $k$ -Nearest Neighbor Information Estimators”, *International Symposium on Information Theory (ISIT)*, Aachen, Germany, 2017.
9. **W. Gao**, S. Oh, P. Viswanath. “Breaking the Bandwidth Barrier: Geometric Adaptive Entropy Estimation”, *Neural Information Processing Systems (NeurIPS)*, Barcelona, Spain, 2016.
10. **W. Gao**, S. Kannan, S. Oh, P. Viswanath. “Conditional Dependence via Shannon Entropy: Axioms, Estimators and Applications”, *International Conference on Machine Learning (ICML)*, New York, NY, USA, 2016.
11. **W. Gao** and Y. Polyanskiy. “On bit-error-rate of repeated error-correcting codes”, *Conference on Information Systems and Sciences (CISS)*, Princeton, NJ, USA, 2014.

#### SERVICES

- Reviewers for conferences.
  - NeurIPS 2016, 2018-2019, ISIT 2016-2019, ICML 2018-2019, AAAI 2018-2019, ICLR 2018-2020.
- Reviewers for journals.
  - IEEE Transactions on Information Theory 2019, IEEE Transactions on Wireless Communication 2018.

#### HONORS AND AWARDS

- NeurIPS Student Travel Award December, 2016, 2017, 2018
- ICML Student Travel Award June, 2016, 2019
- Outstanding Graduates, IIIS, Tsinghua University July, 2014
- Tsinghua-Baidu Scholarship, First Prize October, 2013
- Andrew Chi-Chih Yao Student Award, Recognition Prize June, 2013
- National Scholarship (Top 2% in Tsinghua) November, 2011
- Tsinghua University Freshman Scholarship, Second Prize December, 2010
- China Mathematics Olympic(CMO), First Prize January, 2010

#### LANGUAGES AND SKILLS

- Languages: Mandarin Chinese(native), English(fluent).
- Programming Languages: Python, C/C++, Java, PHP.
- Other Computer Skills: Tensorflow, Pytorch, MATLAB,  $\text{\LaTeX}$ .