DINGYU WANG

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EDUCATION

- Ph.D. candidate, Computer Science, College of Engineering, University of Michigan
  Advisor: Seth Pettie
  Sep. 2019 - Now
- B.S.E., Computer Science, College of Engineering, University of Michigan
  Sep. 2017 - May. 2019
- B.S.E., Electrical and Computer Engineering, SJTU-UM Joint Institute, Shanghai Jiao Tong University
  Sep. 2015 - Aug. 2017 and June. 2019 - Aug. 2019

PUBLICATIONS

- Universal Perfect Samplers for Incremental Streams (SODA25), with Seth Pettie
  We develop a new tool—G-transformation of exponential random variables—that can be used to build perfect samplers and other more general samplers over incremental streams.

- Multi-dimensional Approximate Counting (SOSA25)
  We present a simple and optimal multidimensional counter with respect to the Euclidean norm.

- Better Cardinality Estimators for HyperLogLog, PCSA, and Beyond (PODS23), with Seth Pettie
  We construct and analyze a class of τ-generalized remaining area estimators which generalize classic estimators like LogLog and HyperLogLog. It beats HyperLogLog slightly by choosing the optimal τ.

- Non-Mergeable Sketching for Cardinality Estimation (ICALP21), with Seth Pettie and Longhui Yin
  We study sketching schemes for the sequential cardinality estimation problem with variance analysis.

- Information Theoretic Limits of Cardinality Estimation: Fisher meets Shannon (STOC21), with Seth Pettie
  We study the intrinsic tradeoff between the space complexity of the sketch and its estimation error for the problem of mergeable cardinality estimation.

- Optimal Protocols for 2-Party Contention Resolution (SSS21)
  We present optimal contention resolution protocols for size-2 collisions in the acknowledgement-based model.

MANUSCRIPTS

- Sketching, Moment Estimation, and the Lévy-Khintchine Representation Theorem (submitted to ITCS25), with Seth Pettie
  We demonstrate how to reinterpret all previous streaming sketches in the perspective of Lévy processes and how this connection leads to new, powerful sketches.

- Universal Harmonic Sketching over Turnstile Streams
  Traditionally universal data sketches are constructed through sampling and/or detecting heavy hitters. We demonstrate how streaming moments can be estimated by decomposing the target into harmonic components.

- Fraud Detection in Sketching and Streaming
  We consider the process of k-MIN sketch and device a novel approach to detect aggregated inflation/deflation: We look at this random process at the jumps of another random process.

TEACHING

- GSI (Graduate Student Instructor) of *Advanced Data Structures*, EECS 498-009, Fall2024, U of M
- GSI of *Introduction to Operating Systems*, EECS 482, Fall2022, U of M
- GSI of *Algorithms*, EECS 586, Winter2022, U of M
- GSI of *Foundations of Computer Science*, EECS 376, Fall2021/Fall2023, U of M
- TA (Teaching Assistant) of *Electromagnatics*, 2019, SJTU
- TA of *Honors Physics I*, 2017, SJTU

HONORS

- Honor Competition finalist, 2021, CSE, U of M
- Jackson and Muriel Lum Scholarship, 2017-2018, U of M
- Excellent Teaching Assistant Award, 2017, Joint Institute, SJTU
- John Wu and Jane Sun Sunshine Scholarship, 2016-2017, Joint Institute, SJTU