Yuchao Tao

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Education

- **Duke University** — Durham, NC
  PhD in Computer Science — *Aug. 2018 – Present*
- **Duke University** — Durham, NC
  Master of Science in Computer Science (non-degree) — *Aug. 2017 – Jun. 2018*
- **Hong Kong University of Science and Technology** — Hong Kong, China
  Exchange Program of Computer Science — *Feb. 2016 – May. 2016*
- **Shanghai Jiao Tong University** — Shanghai, China
  Bachelor of Science in Computer Science — *Sep. 2013 – Jun. 2017*

Research Interest

- **Differential Privacy:** I'm generally interested in statistic releases under differential privacy that includes synthetic dataset release and SQL query answering. Differentially private synthetic dataset allows unlimited downstream tasks using the data without privacy concern. Differentially private answering SQL queries allows a relational database system to be publicly accessible under the privacy constraints.

Publications

- **Benchmarking Differentially Private Synthetic Data Generation Algorithms**
  Yuchao Tao, Ryan McKenna, Michael Hay, Ashwin Machanavajjhala, Gerome Miklau. PPAI 2022
- **R2T: Instance-optimal Truncation for Differentially Private Query Evaluation with Foreign Keys**
  Wei Dong, Juanru Fang, Ke Yi, **Yuchao Tao**, Ashwin Machanavajjhala. SIGMOD 2021
- **DPGraph: A Benchmark Platform for Differentially Private Graph Analysis**
  Siyuan Xia, Beizhen Chang, Karl Knopf, Yihan He, **Yuchao Tao**, Xi He. SIGMOD 2021
- **Prior-Aware Distribution Estimation for Differential Privacy (Second place winner of NIST 2020 Differential Privacy Temporal Map Challenge, Sprint 2)**
  Yuchao Tao, Johes Bater, Ashwin Machanavajjhala. TPDP 2021
- **Computing Local Sensitivities of Counting Queries with Joins**
  Yuchao Tao, Xi He, Ashwin Machanavajjhala, Sudeepa Roy. SIGMOD 2020.
- **PrivateSQL: A Differentially Private SQL Query Engine**
  Kotsogiannis Ios, **Yuchao Tao**, Xi He, Maryam Fanaeepour, Ashwin Machanavajjhala, Michael Hay, and Gerome Miklau. VLDB 2019.
- **Architecting a Differentially Private SQL Engine**
  Ios Kotsogiannis, **Yuchao Tao**, Ashwin Machanavajjhala, Gerome Miklau, Michael Hay. In CIDR. 2019.

Experience

- **Tumult Labs** — Durham, NC, USA
  Research Science Intern — *Jun 2021 - Aug 2021*
  - Conducted a comprehensive benchmark for various types of differentially private synthetic data algorithms.
  - Explored and studied the metrics for evaluating the performance of a synthetic data generation algorithm.
  - Examined and detected the differential privacy violations among existing synthetic data generation algorithms.
- **Tumult Labs** — Durham, NC, USA
  Research Science Intern — *Jun 2020 - Aug 2020*
  - Studied the problem about releasing confidence intervals of medians under differential privacy.
  - Conducted complex experiments with 100+ configurations.
  - Accomplished comprehensive visualizations and analyses with 50+ graphs.

- **Alibaba** Seattle, WA, USA
  Research Science Intern *Jun 2019 - Aug 2019*
  - Studied the problem of load traffic counting under differential privacy.
  - Implemented the UDF of frequency oracle under LDP for the BigCompute database of Alibaba.
- **Intel** Shanghai, China
  Software Developer Intern *Feb 2017 - Jun 2017*
  - Analyzed the computation performance between Intel BigDL and Yahoo TensorFlowOnSpark.
  - Provided team support about Spark configurations and cluster settings.
- **McGill University** Montreal, Canada
  Research Assistant *Jun. 2016 - Aug. 2016*
  - Accomplished a sensitivity analysis of 121 parameters from the bio-computational model.
  - Improved the consistency model for the randomness of multi-threading computation.
  - Published a poster: "Shung, C., Tao, Y.C.*, Mongeau, L., & Li-Jessen, N.Y.K (2016, September). Agent-based models of engineering biomaterials for vocal fold reconstruction. [ICSB]"