Da Wei (David) Zheng

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PhD candidate researching algorithms and data structures involving geometry and graphs.

Education

- **University of Illinois Urbana-Champaign (GPA: 3.99)** Champaign, IL
  PhD Computer Science (Theory) *Aug 2020 - (expected) May 2025*
  Advisor: Timothy Chan
- **University of British Columbia** Vancouver, BC
  MSc Computer Science (Theory) *Sep 2018 - Aug 2020*
  Advisor: William Evans
  Thesis: Scheduling queries to moving entities to certify many are distant from a region
- **University of British Columbia** Vancouver, BC
  BSc Combined Honours Mathematics and Computer Science *Sep 2014 - May 2018*

Internships

- **Nuro** Mountain View, CA
  PhD Intern, "Occlusion-aware autonomous driving" *May 2022 - Aug 2022*
- **Google LLC** Mountain View, CA
  Software Engineering Intern, "Querying payments change history" *May 2018 - Aug 2018*
- **Facebook Inc.** Menlo Park, CA
  Software Engineering Intern, "Integrating VMs in container service" *Jun 2017 - Sep 2017*
- **Dr. Daniel Coomb's Applied Mathematics Lab** University of British Columbia
  USRA Research intern, "Graph based clustering for data analysis" *May 2016 - Aug 2016*

Publications

- (*In submission*) Da Wei Zheng. "A Simple Approximation Scheme for Bipartite Geometric Many-to-Many Matching".
- (*In submission*) Adam Karczmarz and Da Wei Zheng. "Subquadratic algorithms in minor-free digraphs: (weighted) distance oracles, decremental reachability, and more".
- (**ESA 2024**) Elfarouk Harb, Zhengcheng Huang, and Da Wei Zheng . "Shortest Path Separators in Unit Disk Graphs". Vol. 308. 66:1–66:14.
- (**ESA 2024**) Chandra Chekuri, Rhea Jain, Shubhang Kulkarni, Da Wei Zheng, and Weihao Zhu . "From Directed Steiner Tree to Directed Polymatroid Steiner Tree in Planar Graphs". Vol. 308. 42:1–42:19.
- (**CCCG 2024**) Eliot W. Robson, Jack Spalding-Jamieson, and Da Wei Zheng . "Carving Polytopes with Saws in 3D". pp. 145–151.
- (**SoCG 2024**) Timothy M. Chan, Pingan Cheng, and Da Wei Zheng . "Semialgebraic Range Stabbing, Ray Shooting, and Intersection Counting in the Plane". Vol. 293. 33:1–33:15.
- (**SODA 2024**) Timothy M. Chan, Pingan Cheng, and Da Wei Zheng . "An Optimal Algorithm for Higher-Order Voronoi Diagrams in the Plane: The Usefulness of Nondeterminism". Pp. 4451–4463.

- (**SODA 2024**) Yi-Jun Chang and Da Wei Zheng . "Fully Scalable Massively Parallel Algorithms for Embedded Planar Graphs". Pp. 4410–4450.
- (**ICALP 2023**) Monika Henzinger, Paul Liu, Jan Vondrák, and Da Wei Zheng . "Faster Submodular Maximization for Several Classes of Matroids". Vol. 261. 74:1–74:18.
- (**IPCO 2023**) Da Wei Zheng and Monika Henzinger . "Multiplicative Auction Algorithm for Approximate Maximum Weight Bipartite Matching". Vol. 13904. Pp. 453–465.
- (**SODA 2023**) Timothy M. Chan and Da Wei Zheng . "Simplex Range Searching Revisited: How to Shave Logs in Multi-Level Data Structures". Pp. 1493–1511.
- (**SODA 2023**) Sariel Har-Peled and Da Wei Zheng . "Halving by a Thousand Cuts or Punctures". Pp. 1385–1397.
- (**SoCG 2022**) Jack Spalding-Jamieson, Brandon Zhang, and Da Wei Zheng . "Conflict-Based Local Search for Minimum Partition into Plane Subgraphs". Vol. 224. 72:1–72:6.
- (**SODA 2022**) Timothy M. Chan and Da Wei Zheng . "Hopcroft's Problem, Log-Star Shaving, 2D Fractional Cascading, and Decision Trees". Pp. 190–210.
- (**SoCG 2021**) Paul Liu, Jack Spalding-Jamieson, Brandon Zhang, and Da Wei Zheng . "Coordinated Motion Planning Through Randomized k-Opt (CG Challenge)". Vol. 189. 64:1–64:8.
- (**SoCG 2020**) Da Wei Zheng, Jack Spalding-Jamieson, and Brandon Zhang . "Computing Low-Cost Convex Partitions for Planar Point Sets with Randomized Local Search and Constraint Programming (CG Challenge)". Vol. 164. 83:1–83:7.

Awards

- NSERC PGS-D Scholarship 2022-2025
- NSERC Undergrad Summer Research Award 2016
- Trek Excellence Scholarship 2015
- Stanley M Grant Scholarship in Mathematics 2015
- Chancellor's Scholar Award 2014
- BC Provincial Scholarship 2014

Teaching

- **Department of Computer Science** University of Illinois Urbana-Champaign
  Teaching Assistant
  - CS 374 - Algorithms and Models of Computation *Aug 2021 - Apr 2022*
- **Department of Computer Science and Mathematics** University of British Columbia
  Instructor
  - CPSC 490 - Problem Solving in Computer Science *Jan 2017 - Apr 2017*

  Teaching Assistant
  - CPSC 420 - Advanced Algorithms and Data Structures *Sep 2018 - May 2019*
  - CPSC 221 - Algorithms and Data Structures *Jun 2016 - Apr 2017*
  - MATH 180 - Differential Calculus with Physical Applications *Sep 2015 - Dec 2015*

Other

- **Competitive Programming** University of Illinois Urbana-Champaign
  Coach
  - *Coach* - Ran local practices, problem discussion, and coached teams. *Aug 2022 - now*
    - Coached team to 1st in Mid Central USA 2022, 1st in Mid Central USA 2023. 63rd place in ICPC World Finals 2022. 51st place in ICPC World Finals 2024.
- **Competitive Programming Club** University of British Columbia
  Coach and Participant
  - *Coach* - Ran local practices, problem discussion, and coached teams. *Sep 2017 - Dec 2020*
    - Coached team to 1st in PacNW 2019, 2nd PacNW 2020. 25th place in ICPC World Finals 2020. Qualified for ICPC World Finals 2021.
    - Created questions and hosted the UBC Programing Contest 2019 and 2020.
  - *Participant* - Worked as a team of three in competitions. *Jan 2015 - Jul 2019*
    - 1st place in PacNW 2018 and 41st place in ICPC World Finals 2019 in Porto.
    - 3rd place in PacNW 2017 and 56th place in ACM-ICPC World Finals 2018 in Beijing.
- **UBC Math Circle** University of British Columbia
  Organizer - weekly lectures and problems for high school students. *Sep 2017 - Nov 2017*
- **Capture the Flag (CTF) Competitions** Maple Bacon (UBC) & SIGPwny (UIUC)
  Participant *Aug 2021 - Sept 2022*