

# Da Wei (David) Zheng

<https://zhengdw.github.io/>

650-898-3069

dwzheng2@illinois.edu

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

## Education

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- **University of Illinois Urbana-Champaign (GPA: 3.99)** Champaign, IL  
*PhD Computer Science (Theory)* Aug 2020 - 2024/2025  
**Advisor:** Timothy Chan
- **University of British Columbia (Average: 90%)** 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 (average: 87%)** Vancouver, BC  
*BSC Combined Honours Mathematics and Computer Science* Sep 2014 - May 2018

## Internships

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- **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

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- **(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. *CoRR*, abs/2310.15363, 2023.
- **(SODA 2024)** Yi-Jun Chang and Da Wei Zheng. Fully scalable massively parallel algorithms for embedded planar graphs. *CoRR*, abs/2304.07441, 2023.
- **(ICALP 2023)** Monika Henzinger, Paul Liu, Jan Vondrák, and Da Wei Zheng. Faster submodular maximization for several classes of matroids. In Kousha Etessami, Uriel Feige, and Gabriele Puppis, editors, *50th International Colloquium on Automata, Languages, and Programming, ICALP 2023, July 10-14, 2023, Paderborn, Germany*, volume 261 of *LIPIcs*, pages 74:1–74:18. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2023.
- **(IPCO 2023)** Da Wei Zheng and Monika Henzinger. Multiplicative auction algorithm for approximate maximum weight bipartite matching. In Alberto Del Pia and Volker Kaibel, editors, *Integer Programming and Combinatorial Optimization - 24th International Conference, IPCO 2023, Madison, WI, USA, June 21-23, 2023, Proceedings*, volume 13904 of *Lecture Notes in Computer Science*, pages 453–465. Springer, 2023.
- **(SODA 2023)** Timothy M Chan and Da Wei Zheng. Simplex range searching revisited: How to shave logs in multi-level data structures. In *Proceedings of the 2023 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1493–1511. SIAM, 2023.

- **(SODA 2023)** Sarel Har-Peled and Da Wei Zheng. Halving by a thousand cuts or punctures. In *Proceedings of the 2023 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1385–1397. SIAM, 2023.
- **(SODA 2022)** Timothy M Chan and Da Wei Zheng. Hopcroft’s problem, log-star shaving, 2d fractional cascading, and decision trees. In *Proceedings of the 2022 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 190–210. SIAM, 2022.
- **(SoCG 2022)** Jack Spalding-Jamieson, Brandon Zhang, and Da Wei Zheng. Conflict-based local search for minimum partition into plane subgraphs (cg challenge). In *38th International Symposium on Computational Geometry (SoCG 2022)*. Schloss Dagstuhl-Leibniz-Zentrum für Informatik, 2022.
- **(SoCG 2021)** Paul Liu, Jack Spalding-Jamieson, Brandon Zhang, and Da Wei Zheng. Coordinated motion planning through randomized k-opt (CG challenge). In Kevin Buchin and Éric Colin de Verdière, editors, *37th International Symposium on Computational Geometry, SoCG 2021, June 7-11, 2021, Buffalo, NY, USA (Virtual Conference)*, volume 189 of *LIPICs*, pages 64:1–64:8. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2021.
- **(SoCG 2021)** 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). In Sergio Cabello and Danny Z. Chen, editors, *36th International Symposium on Computational Geometry, SoCG 2020, June 23-26, 2020, Zürich, Switzerland*, volume 164 of *LIPICs*, pages 83:1–83:7. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2020.

## Awards

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| • NSERC PGS-D Scholarship                    | 2022 |
| • 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

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|---|---|
| • <b>Department of Computer Science</b>                       | University of Illinois Urbana-Champaign |
| <i>Teaching Assistant</i>                                     |   |
| – CS 374 - Algorithms and Models of Computation               | <i>Aug 2021 - Apr 2022</i>              |
| • <b>Department of Computer Science and Mathematics</b>       | University of British Columbia          |
| <i>Instructor</i>   |   |
| – CPSC 490 - Problem Solving in Computer Science              | <i>Jan 2017 - Apr 2017</i>              |
| <i>Teaching Assistant</i>                                     |   |
| – CPSC 420 - Advanced Algorithms and Data Structures          | <i>Sep 2018 - May 2019</i>              |
| – CPSC 221 - Algorithms and Data Structures                   | <i>Jun 2016 - Apr 2017</i>              |
| – MATH 180 - Differential Calculus with Physical Applications | <i>Sep 2015 - Dec 2015</i>              |

## Other

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- **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 WF 2020.
      - Created questions and hosted the UBC Programming 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 - now*