

Jiaqi Zheng

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🌐 <https://github.com/orzzzjq>

🏠 <https://orzzzjq.github.io/aboutme>

EDUCATION

National University of Singapore, Singapore

Aug. 2020 – Present

Ph.D. in Computer Science

- **Current Cumulative GPA:** 4.79/5.0
- **Selected Scholarships & Awards:** Research Scholarship, Research Incentive Award

Harbin Engineering University, China

Aug. 2016 – June 2020

B.Eng. in Computer Science and Technology

- **Core Course GPA:** 3.84/4.0
- **Selected Scholarships & Awards:** Excellent Graduation Thesis - *Awarded to top 2% of the cohort*
National Incentive Scholarship - *Awarded to top 2% of the cohort*
Gold Medal of ACM-ICPC Chinese Collegiate Programming Contest - *Nationwide competition with 420 participants*
Silver Medal of ACM-ICPC Asia Regional Contest × 2 - *Asian-wide competition with 373 & 298 teams participating, resp.*
Bronze Medal of ACM-ICPC Asia-East Continent Final - *Asian-wide competition with 374 teams participating*

WORK EXPERIENCE

Institute of Science and Technology, Austria

Oct. 2024 – Present

Predoctoral Visiting Scientist, hosted by Herbert Edelsbrunner

- **Roles:** Investigating topics in geometric optimization and topological data analysis (TDA)
- **Achievements:** Improved the performance of an existing TDA library by a factor of two.

National University of Singapore, Singapore

July 2019 – July 2020

Research Intern in the Geometry & Graphics Lab, hosted by Tiow-Seng Tan

- **Roles:** Researching and implementing parallel algorithms for computational geometry problems
- **Achievements:** Developed three open-sourced libraries, and published one academic paper

RESEARCH & PUBLICATIONS

Research focus: Convex Optimization, Computational Geometry, Parallel Computing (GPGPU)

- **Approximation Algorithms for Smallest Intersecting Balls**

Jiaqi Zheng and Tiow-Seng Tan

- **A Primal-Dual Algorithmic Framework for Symmetric Cone Programming**

Jiaqi Zheng, Antonios Varvitsiotis, Tiow-Seng Tan, Wayne Lin

- **Computing Centroidal Voronoi Tessellation Using the GPU**

Jiaqi Zheng and Tiow-Seng Tan

Interactive 3D Graphics and Games (I3D), 2020

SKILLS

Programming: C/C++, CUDA, Python, Java, C#

Libraries & Tools: CGAL, PyTorch, Unity Engine, MPI/OpenMP, LaTeX

Languages: English (professional), Chinese (native)

DEVELOPMENT PROJECTS

LIBSIB: The first library for computing *Smallest Intersecting Balls* in high-dimensional spaces

- Capable of solving the problem for various types of input objects such as convex polytopes, balls, and ellipsoids
- The problem is related to many important problems such as SVM and SVDD in machine learning

PDSCP: A novel algorithmic framework for *Symmetric Cone Programming* (which generalizes LP, SDP, and SOCP)

- Has been applied to develop efficient parallel algorithms for Smallest Enclosing Sphere and Support Vector Machine
- Outperforms the best commercial conic programming solvers – IBM Cplex and Gurobi – in these two tasks

PosLP: A library for computing *Positive Linear Programs* using GPU

- Implements and improves the existing theoretical parallel algorithms for PosLP

PBA+: The most efficient open-sourced library for computing 2D and 3D *Digital Voronoi Diagrams* on GPU

- Processes very large-scaled input images (up to $32K \times 32K$ pixels) in the order of hundreds of milliseconds

- The source code has been integrated into game engines and motion-planning projects

gCVT: An open-sourced library for computing 2D and 3D *Centroidal Voronoi Tessellations* (CVT) on GPU

- Adopts the over-relaxed Lloyd's method for minimizing the objective function and outperforms existing optimizers

Surface Remesh: An open-sourced project for optimizing *Surface Meshes* using 2D Centroidal Voronoi Tessellations

- Parameterizes triangulated surface meshes in planar spaces and optimizes the positions of the vertices via CVTs

TEACHING & MENTORING

National University of Singapore, Singapore

Jan. 2021 – June 2024

Teaching Assistant in Department of Computer Science

- **Teaching Modules:** Programming Methodology, Introduction to 2D Game Development
- **Roles:** Conducting tutorials and consultations - *Received positive feedback every year*