Yuchen Su

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30 Shuangqing Rd, Tsinghua University, Beijing, China

EDUCATION

Tsinghua University, Beijing, China Aug. 2022 – Jul. 2026 (expected)

Bachelor of Engineering in Engineering Mechanics

Tsien Excellence in Engineering Program (Qian Class), Xingjian College

- **GPA:** 3.944/4.000 **Rank:** 3/28 (Major) 8/145 (College)
- **Core Courses:** Advanced Algebra and Geometry (4.0), Advanced Calculus (4.0), Solid Mechanics (4.0), Fluid Mechanics (4.0), C++ Programming (4.0), Scientific and Engineering Computing (4.0)
- **TOEFL:** 105

SKILLS AND INTERESTS

- **Skills:** C/C++, Python, GPU Programming (CUDA), Taichi, OpenGL/PolyScope, MATLAB
- **Interests:** Computer Graphics, Physics-Based Simulation, Computational Design, Parallel Computation

RESEARCH EXPERIENCE

Computational Design and Simulation of an Origami-Inspired Flier *September 2024 - Present*

Guided by Tao Du, Institute for Interdisciplinary Information Sciences (IIIS), Tsinghua University

- Developed a **rigid-body** simulation of an origami-inspired flier using the **Extended Position-Based Dynamics (XPBD)** method, successfully modeling folding dynamics and validating the project's feasibility through airfoil theory. **PolyScope** was used for visualization.
- Implemented a 3D fluid simulation model based on **stable fluid** using **Taichi**, which simulates phenomena such as the **Kármán vortex street**.

Adaptive Visual Perception and Hardware-Software Acceleration for Micro Unmanned Aerial Vehicles

Guided by Hongyang Jia, Department of Electrical Engineering, Tsinghua University *May 2023 - September 2024*

- Designed and implemented a **CUDA-accelerated Schur Complement Solver** within the Ceres Solver framework, utilizing **GPU parallelization** and **low-precision quantization** to enhance computational speed while maintaining numerical stability in real-time robotics applications.
- Developed a **precision-adaptive** visual processing algorithm in C++, based on the physical properties of the environmental conditions. Enabled dynamic adjustments to computational fidelity and achieved an optimal balance between visual accuracy and computational efficiency.
- Conducted a comprehensive performance analysis of the **Cholesky Solver** and **Schur Complement** across various matrix sizes, computational precisions, and CPU/GPU configurations.
- Awarded **A+** in the Students' Research Training Program for technical contributions and innovation.

Hint-AD: Holistically Aligned Interpretability in End-to-End Autonomous Driving

Guided by Hao Zhao, Institute for AI Industry Research, Tsinghua University *April 2024 - August 2024*

- Defined labeling criteria and constructed the dataset to support the evaluation of the algorithm.

Vacuum Multi-Scale Particle Flow *July 2024 - August 2024*

- Multi-scale particle flow simulation using LIGGGHTS based on the **Discrete Element Method (DEM)**. Visualization and force analyses using **Paraview**

PUBLICATIONS

[1] Shuyuan Zhang, Yujin Wang, Yifan He, **Yuchen Su**, Huazhong Yang, Yongpan Liu, and Hongyang Jia. (2024). **A Unified Microrobotic Visual-Perception Processor with 62.2-FPS/mm^2 and 103-µJ/Frame Navigation in 28nm**. In *Proceedings of the IEEE Asian Solid-State Circuits Conference (ASSCC)*, 2024.

[2] Kairui Ding, Boyuan Chen, **Yuchen Su**, Huan-ang Gao, Bu Jin, Chonghao Sima, Wuqiang Zhang, Xiaohui Li, Paul Barsch, Hongyang Li, and Hao Zhao. (2024). **Hint-AD: Holistically Aligned Interpretability in End-to-End Autonomous Driving**. In *Proceedings of the Conference on Robot Learning (CoRL)*, 2024.

HONORS AND AWARDS

"Wang Dazhong" Scholarship (Comprehensive Excellence Scholarship) *2024*
- Awarded 20 outstanding undergraduates annually at Tsinghua University.

Comprehensive Excellence Scholarship *2023*
First Prize in the National College Student Physics Competition (Non-Physics Group) *2023*
Outstanding Student Science Association Member *2023*

LEADERSHIP AND EXTRACURRICULAR ACTIVITIES

Minister of the Executive Department, Student Science Association, Xingjian College *September 2023 - June 2024*
- Founded the Xingjian College Student Science Journal and organized several student science salons.