

# HONGTU XU

393 Middle Huaxia Rd, Shanghai, China 201210    Homepage: <https://xuht.graphics>  
✉ [xuht\\_2000@163.com](mailto:xuht_2000@163.com) · ☎ (+86) 138-8017-4863 · 🌐 <https://github.com/xehoth>

## EDUCATION

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**ShanghaiTech University**, Shanghai, China

Aug. 2019 – July 2023 (expected)

*Bachelor of Engineering, Computer Science and Technology*

- Overall GPA: 3.86/4.00, Ranking: 2/166 (**Top 2%**), Major GPA: **4.0/4.0**, A+ in all CS courses
- Relevant Coursework: Computer Graphics I, Computer Graphics II\*, Parallel Computing, Computer Architecture I, Operating System, Probability and Statistics, C/C++ Programming, Algorithm Design and Analysis\*, Discrete Mathematics, Algorithms and Data Structures (\* graduate-level courses)

## WORK AND RESEARCH EXPERIENCE

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**Efficient Aeroacoustics Simulation** | *Research Assistant*

Oct. 2021 – Present

Advisor: Prof. Xiaopei Liu at ShanghaiTech University and Prof. Changxi Zheng at Columbia University

- Proposed a 3D overset grid method under cumulant LBM by extending a 2D derivation
- Improved accuracy of transition between grid boundaries using a compact second-order interpolation
- Improved precision of fictitious force using half-force correction
- Contributed to the first work that directly simulates acoustics in turbulent flows in computer graphics
- *Preparing for paper submission to a premier venue in computer graphics (e.g. SIGGRAPH 2023)*

**High-Performance Realistic Volume Rendering** | *Research Assistant*

June 2021 – April 2022

Advisor: Prof. Xiaopei Liu, ShanghaiTech University

- Led and designed a modularized architecture to support acceleration with CUDA and OptiX
- Proposed a bitmask-based volume stack to efficiently handle multiple mixing participating media
- Implemented several state-of-the-art methods in SIGGRAPH papers for transmittance estimation
- *Integrated into a piece of new-generation CAE software in a startup company as its rendering module*

## HONORS AND AWARDS

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- **Gold Medal**, The 2020 ACM-ICPC Asia Yinchuan Regional Contest    May 2021
- **Gold Medal**, The 2020 ACM-ICPC Asia Nanjing Regional Contest    Dec. 2020
- **Silver Medal**, 2020 China Collegiate Programming Contest, Weihai Site    Oct. 2020
- Academic Excellence Scholarship, ShanghaiTech University    2021, 2020
- **1st Prize**, The National Olympiad in Informatics in Provinces, Sichuan    Nov. 2018, 2017, 2016

## SELECTED PROJECTS

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- **GEOM**: Implemented several computational geometry algorithms, including 3D convex hull, GJK collision detection, 2D Delaunay Triangulation, Chordal Axis Transform, isosurface extraction and more
- **Pintos**: A simple operating system supporting threads, user programs, virtual memory, and file systems
- **LNano**: Developed a rhythm game and a low-level software rasterization renderer using C and RISC-V

## TEACHING EXPERIENCE

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**CS171 Computer Graphics I, ShanghaiTech** *Teaching Assistant*

Sept. 2021 – Jan. 2022

**CS100 Introduction to Programming, ShanghaiTech** *Teaching Assistant*

Feb. 2021 – June 2021

**SI100B Introduction to Information Science and Technology** *Teaching Assistant*

Sept. 2020 – Jan. 2021

## SKILLS AND INTERESTS

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- Programming: C/C++ (including modern C++), CUDA, Python, Java, MATLAB, C#, JavaScript
- Tools: CMake, git, L<sup>A</sup>T<sub>E</sub>X, Unity, Docker, OpenGL, OptiX 7, OpenMP, MPI, PBRT, Mitsuba
- Languages: Chinese (Native), English (Fluent)