

Junwei Jiang

✉ junwei.jiang97@outlook.com | 🏠 homepage | 🌐 junwei-jiang | 📺 Junwei Jiang

Education

Technical University of Munich

Ph.D. Candidate - Chair of Computer Graphics and Visualization

Jun. 2024 – Now

Munich, DE

- **Supervisor:** Prof. Dr. Rüdiger Westermann
- **Research Topic:** Neural Rendering, 3D Gaussian Splatting

Technical University of Munich

Research Assistant - Chair of Aerodynamics and Fluid Mechanics

Sep. 2023 – Jan. 2024

Munich, DE

- **Supervisor:** PD Dr.-Ing. habil. Xiangyu Hu
- **Research Topic:** GPU Acceleration for Multi-physical SPH Simulations

Sichuan University

Master of Science in Engineering - Computer Science

Sep. 2020 – Jun. 2023

Chengdu, CN

- **Supervisor:** Prof. Dr. Yanci Zhang
- **Courses:** Numerical Calculation, Computer Graphics, Game Architecture, Virtual Reality, etc
- **GPA:** 3.83/4.0 (Top 5%)

Sichuan University

Bachelor of Science in Engineering - Computer Science

Sep. 2016 – Jun. 2020

Chengdu, CN

- **Courses:** Calculus, Linear Algebra, Probability Statistics, Computer Graphics, Machine Learning, etc
- **GPA:** 3.76/4.0 (Top 4%)

Publications

[1] A Second-Order Explicit Pressure Projection Method for Eulerian Fluid Simulation

ACM SIGGRAPH / Eurographics Symposium on Computer Animation / Computer Graphics Forum

Jul. 2022

Durham, UK

Junwei Jiang, Xiangda Shen, Yuning Gong, Zeng Fan, Yanli Liu, Guanyu Xing, Xiaohua Ren, Yanci Zhang

[2] Parallel Real-Time Bone Driven Secondary Deformation Based on Clique Coloring

Computer Aided Design and Computer Graphics (CAD/CG 2021)

May. 2021

Dalian, CN

Yusong Fu, Junwei Jiang, Yina Lv, and Yanci Zhang

Skills

Programming: C/C++, Python, C#, \LaTeX , Matlab, Linux

Frameworks: CUDA, OneAPI, OpenGL, Vulkan, DirectX, Pytorch, Intel Tbb, OpenVDB, Git

Engines: Unity, Unreal, Blender, 3ds Max

Tools: PhotoShop, Premiere Pro, etc

English: IELTS 6.5

Research Experiences

3D Gaussian Splatting

Munich, DE

Real-Time Rendering, Neural Rendering, Deep Learning, 3D Reconstruction

Jun. 2024 – Now

- Brief Introduction: Trying to improve 3D Gaussian Splatting, mainly focusing on trying better early initialization methods(ongoing, with great potential); try to combine alternating optimization/multi-grid/MoE with 3D Gaussian Splatting, etc

More Accurate and Fast Eulerian Fluid Simulation [1]

Chengdu, CN

Computer Animation, Physics Based Simulation, Fluid Simulation, Parallel Computing, CFD Feb. 2022 - May. 2022

- Brief Introduction: Improving the Reflection Solver by explicitly advecting pressure gradient. The computational overhead is reduced to half while retaining its time accuracy.
- Main Responsibilities: Build the parallel Eulerian fluid simulation engine with CUDA and Compute Shader; Reproduce some mainstream algorithms and analyze the problems of them; Propose solutions and implement them with code; Carry out comparative experiments, analysis and chart making; Paper writing.

Parallel Real-Time Soft Body Simulation [2]

Chengdu, CN

Computer Animation, Physics Based Simulation, Soft Body Simulation, Parallel Computing Jan. 2021 - Jun. 2021

- Brief Introduction: Realize the physical based non-active secondary soft deformation effect by PBD and layered stiffness model. And a new coloring scheme is proposed to solve the physical system in parallel.
- Main Responsibilities: Conceive and implement a new coloring algorithm; Carry out comparative experiments, analysis and chart making; Writing the relevant part of the paper; Partial implementation of Unreal Engine plug-in.

Real-Time Dynamic Diffuse Global Illumination Based on Light Field Probe

Chengdu, CN

Real-Time Rendering, Global Illumination, Light Field Probe

Sep. 2019 - Mar. 2020

- Brief Introduction: Record the light field information of the scene by light field probes. Use the specially designed algorithm to query and calculate the multiple diffuse reflections.
- Main Responsibilities: Build the rendering pipeline; Reproduce the DDGI algorithm; Build and test the acceptance scene.

Projects

Large Scale Real-Time Fluid Simulation

Chengdu & Hangzhou, CN

Computer Animation, Physics Based Simulation, Fluid Simulation, Parallel Computing

Jun. 2021 - Feb. 2022

- Brief Introduction: A NetEase pre-research project, which uses mixed Lagrangian particles, Eulerian grids and shallow water equation height fields to achieve a compromise between performance and accuracy.
- Main Responsibilities: Build the parallel Eulerian fluid simulation engine with CUDA and Compute Shader; Reproduce some mainstream algorithms; Mix grids and particles; Simple flow visualization; Export data for reconstruction and rendering.

Real-Time Remote Assistance System Based on Hololens

Chengdu, CN

VR / AR, Affine Transformation, Network Transmission, Remote Collaboration

Sep. 2020 - Jan. 2021

- Brief Introduction: Develop a remote assistance system similar to Microsoft Dynamics 365. With the help of Hololens, guidance experts in different places can share the screen with front-line engineers remotely and in real time, and give instructions on the screen to achieve the function of remote assistance.
- Main Responsibilities: Draw and serialize instructions on the expert side; Display instructions at the correct position on the engineer side.

Honors and Awards (Selected)

National Inspirational Scholarship - Dec. 2019 & 2018 & 2017

Comprehensive Second Class Scholarship of Sichuan University top 4% students in SCU - Nov. 2018

Comprehensive Third Class Scholarship of Sichuan University top 9% students in SCU - Nov. 2019 & 2017

Outstanding Postgraduate Student of Sichuan University - Oct. 2021

Outstanding Student of Sichuan University - Jun. 2017