

# JiaXin Wang

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## EDUCATION

**Hangzhou Dianzi University**

September 2020 - June 2024

*Bachelor of Science in Computer Science*

*Current GPA: 3.8/5.0*

## RELEVANT COURSEWORK

**Courses:** Advanced Mathematics (82), Linear Algebra (92), Object Oriented Programming (88), Data Structures (89) - Course Practicum (100), Probability Theory (83), Deep Learning (99), Computer Graphics (92), Creative Practices (100 for four terms), Computer Vision (89), Data Mining (85)

**Awards:** College Innovation and Entrepreneurship Award

**Research Interests:** 3D Reconstruction, Neural Rendering, Digital Human, Generative AI

## SKILLS

**Languages:** C/C++, Python,  $\text{\LaTeX}$

**Tools:** Git/GitHub, Shell, Linux, ChatGPT, Markdown, CMake, Smart and Strong HANDS

**Frameworks:** Pytorch, cuda, opencv, pytorch3D

**DeepLearning:** 3D AIGC, 3D Human Avatar, NeRF/3DGS, Implicit Representation, Talking face Generation

**ComputerHardware:** PC DIY, Network Configuration, Computer Troubleshooting

## RESEARCH EXPERIENCE

**GG-Avatar** | *Dynamic Facial Geometric Adjustment for Gaussian Head Avatar*

Mar 2024 - Present

- Gaussian avatars have been studied for rendering and animating photo-realistic digital humans. While existing methods rely on the FLAME model's deformation. We use a novel geometry adjuster to enhance the deformation process of Gaussian avatars and get a better result on PSNR, SSIM, and lpips.
- We achieve SOTA in the public dataset using fewer Gaussian points and training steps. We have published this work on PG(Pacific Graphics) 2024.

**HC-NeRF** | *Using a residual MLP to enhance scene representation*

Jan 2024 - Apr 2024

- Hierarchical Collision Based Radiance Field Representation with Implicit Feature Fine-tuning.
- We consider recent NeRF methods in the perspective of collision between features and coordinates. Based on this perspective, we designed a Hierarchical pipeline to handle the collision. feature grid can handle the area that lacks information, and a residual MLP is introduced to tackle the collision in information-intensive areas. Our method achieved per-scene better results and average performance is better than the SOTA model 3DGS. Some scenes can achieve 1st rendering quality in existing methods.

**Hash Function based Tensorial Radiance Field** | *A compact 3D scene representation*

June 2023 - March 2024

- Under the guidance of my advisor Professor Weichen Dai, I independently developed all of the code for this project based on TensorRF's official code.
- Accelerating Neural Radiation Fields Using Matrix Decomposition Techniques and Multi-resolution Hash Function to eliminate duplicate signals and redundant feature.
- Our full model has the same parameters as TensorRF while achieving better result tests on public synthetic datasets. We are going to submit this work to IEEE Access.

**Grid Cell-based 3D Representation** | *Connections between grid cell and 3D scene comprehension*

Oct 2022 - Present

- Under the guidance of my advisor Professor Weichen Dai, I independently developed all of the code for this project by using the source code of Instant-NGP(CUDA implement).
- Inspired by the hexagonal firing patterns exhibited by grid cells in the brain, we aimed to simulate analogous computational grid networks to encode 3D scene representations. Through this biomimetic approach, we investigated whether grid cell-based architectures could effectively reconstruct high-fidelity scenes and facilitate a deeper understanding of 3D spatial relationships.
- This project is supported by National Natural Science Foundation

## PUBLICATION

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**A semi-implicit Neural Map Construction method based on Grid-like Cell Space coding** | *2nd author*

- patent of invention
- CN116385631A

**GGAvatar: Dynamic Facial Geometric Adjustment for Gaussian Head Avatar** | *Pacific Graphic*

- Co-1st author

**Hierarchical Collision Based Radiance Field Representation with Implicit Feature Fine-tuning** | *Under Review*

- 1st author, Under review, ACM MM

## PROJECTS

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**Visual-Try-On web app** | *Flask, ONNX, OPENVINO, Pytorch, Pyinstaller* Feb – Apr, 2023, Leader

- Developed a simple flask program that functions to implement virtual fitting based on style migration
- Researching models from the SOTA leaderboard and accelerating on them
- Performs project management, scheduling timelines, and assigning work
- Model acceleration and pruning with OPENVINO and ONNX, Model distillation to remove the excess parameters
- Make model 5x faster with 20% model size and only 2% accuracy loss

## EXPERIENCE

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**Mytwins. ai** | *Digital Human AIGC Intern Engineer* Jan-Present, 2024

- Researched cutting-edge digital human algorithms including Geneface++, EMO, SyncTalk, and ER-NeRF, summarizing their distinctions and commonalities.
- Conducted secondary development based on Geneface++, optimizing camera parameter and human segmentation issues in data processing for improved training stability.
- Contributed to developing the company's automated training pipeline, providing a robust and accurate human segmentation algorithm, building a data annotation platform, and implementing data filtering algorithms.

**Volunteer Education** | *Volunteer Teacher* July 2022

Giving handicraft lessons to children from different villages in Jinhua, Zhejiang Province, we visited seven villages and provided two weeks of courses.

**Part-time Pediatric Programming Instructor** | *Tutor* 2022

Teaching Python, Math, and Data Structures to kids.