JiaXin Wang

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EDUCATION

Hangzhou Dianzi University September 2020 - June 2024
Bachelor of Science in Computer Science *Current GPA: 3.84/5.0*

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, LaTeX
Tools: Git/GitHub, Shell, Linux, ChatGPT, MarkDown, CMake
Frameworks: Pytorch, cuda, OPENCV, pytorch3D
DeepLearning: Image:Classfication, Segmentation, 2D AIGC;3D:Human Avatar, NeRF/3DGS, Implicit Representation, Talking face Generation

RESARCH EXPERIENCE

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 TensoRF's official code.
- Accelerating Neural Radiation Fields Using Matrix Decomposition Techniques and Multi-resolution Hash Function to eliminate duplicate signals and redundant feature.
- Based on the decomposition of the 3D feature grid into 2D matrix and 1D vectors by TensoRF, the 2D matrix are further compressed using a multi-hash approach. Further more, I use a MLP to handle the collision between features and give the grid feature a finetune feature, which can generate a more competitive result via use little parameters
- Our full model has the same parameters as TensoRF, and can achieve better result test on public synthetic dataset.

- Our compact model has
- Achieved 70% faster and 50% smaller than baseline(TensoRF), while getting better rendering quality.

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).
- Grid cells are a type of neuron found in mammalian brains that are involved in spatial mapping and path planning. Specifically, grid cells fire action potentials in a periodic hexagonal pattern across environments, representing metric information that allows animals to navigate 3D spaces.
- 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 deeper understanding of 3D spatial relationships.
- Building upon the CUDA-based Instant-NGP, I spearheaded the development of Hash Function based Tensorial Radiance Field (HashRF), implementing efficient neural radiance field hashing and compression routines in Python. Inspired by 2D grid cell patterns presented in related literature, I modified the distribution of mesh vertices in the feature grid to exhibit a hexagonal pattern and proposed a corresponding single-plane resolution adaptation strategy, allocating more features to planes with dense information distribution.

PUBLICATION

A semi-implicit Neural Map Construction method based on Grid-like Cell Space coding | *2rd author*
- patent of invention
- CN116385631A

PROJECTS

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

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

- Mytwins. ai is a company that provides high quality talking face generation(digital human) service.
- The traditional digital human algorithms in the industry are mainly implemented through Convolutional Neural Networks (CNN) and Generative Adversarial Networks (GAN).However, they encountered issues with generating inconsistent or unsynchronized lip movements.
- I am primarily responsible for the exploration and development of NeRF-based talking face generation which can generate consistent and photo-realistic lip movement. Research the latest talking face generation methods, execute their codes, and perform secondary development based on this foundation. I also tried to use 3DGS in this area to generate more realistic digital human.
- I have also developed a series of automated training processes, while interfacing with front-end developers and product managers.

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.