CHUANYU PAN

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Education

University of California, Berkeley Aug 2022 – May 2023
Master of Engineering, Visual Computing and Computer Graphics in Computer Science. **GPA: 4.0/4.0**

Tsinghua University Aug 2017 – Jul 2022
Bachelor of Engineering, Computer Science and Technology. **GPA: 3.8/4.0**

Course Highlights: Computer Graphics, Computer Vision, Machine Learning, VR/AR, Parallel Computing, Distributed System

Skills

- **Programming Language:** Python(strong), C/C++(strong), C#, Java, JavaScript, LaTeX.
- **Framework & Tool:** Pytorch, OpenCV, CUDA, OpenGL, Vulkan, Unity3D, React, Git, Bash, Android Studio.

Experience

Research Engineer Intern - Neural Rendering, *Honda Research Institute (HRI)* Jun 2023 – Present
- Apply **NeRF-guided 3D-aware diffusion** to rare case data synthesis to reach robust behavior prediction.
- Investigate NeRF-based **bird-eye-view (BEV) and occupancy segmentation** on road datasets (e.g., NuScenes).
- Advisor: Aolin Xu | Field: 3D Vision, NeRF, Generative Model | Key tools: Pytorch, OpenCV, CUDA

Project Tech Lead - 3D Object Tracking, *FHL Vive Center at UC Berkeley* Aug 2022 – Jul 2023
- Led **OpenARK** and **Digital Twin Tracking Dataset (DTTD)** project to solve object pose estimation problems in AR/MR.
- Developed real-time **mm-error** 3D object tracking and pose estimation that aim for **general AR applications**.
- Advisor: Allen Y. Yang | Field: 3D Object Tracking, SFM, Camera Calibration | Key tools: C++, Pytorch, ARKit, Kinect

Research Intern - Machine Learning, *Geometric Computing Group at Stanford* Mar 2021 - Oct 2021
- Implemented a novel framework for **robots** to search and find 3D objects in real scenes continuously.
- Proposed a novel **object-centric representation** using network weights and reached **SOTA** performance.
- Advisor: Leonidas Guibas | Publication: ***ICLR2022*** | Field: Representation Learning | Key tools: Pytorch, OpenCV, iThor

Software Engineer Intern - Digital Human, *Beijing Huiye Technology* Jun 2020 - Sep 2020
- Implemented a system to drive **3D real-time facial animation** by audio input with **Pytorch** and **Unity3d**.
- Applied algorithms to a 3D avatar 'Xiaoyu,' **live-streamed** on Bilibili (Youtube in China) and **attracted 312k viewers**.
- Advisor: Buyu Li | Field: Facial Animation, Multi-modal | Key tools: Pytorch, Unity3d

Highlighted Projects

Crime Reality, *MIT Reality Hackathon 2023*
- Built a **VR** application on **Quest2/HTC Vive** that helped crime investigation, winning the **second prize** among 70 teams.
- Field: VR development, Web Development, VR design | Key tools: Unity3d, Oculus, HTC Vive, Reactjs.

Digital Twin Tracking Dataset (DTTD), *FHL Vive Center for Enhanced Reality, UC Berkeley*
- Built a novel **3D object tracking dataset** (DTTD) for AR applications with **Microsoft Azure Kinect** and **iPhone's LiDAR**.
- Set up a complete 3D data-capturing system with novel motion capture sensors and self-developed annotation software.
- Advisor: Allen Y. Yang | Publication: ***CVPRW2023*** | Field: 3D Data Processing | Key tools: OpenCV, Open3D, OptiTrack

3D Cartoon Face Reconstruction and Creation, *Jittor Group, Tsinghua*
- Lead research on **3D cartoon face reconstruction** with **semi-supervised learning** and **mesh deformation**.
- Transformed the research to an **automatic avatar creation** API for VR online meetings with **Pytorch** and **WebGL**.
- Advisor: Shimin Hu | Publication: ***VRIH*** | Field: 3D Reconstruction, VR, Digital Human | Key tools: Pytorch, WebGL

Robust 3D Self-portraits in Seconds, *3D Vision and Computational Photography Lab, Tsinghua*
- Implemented a robust system to **reconstruct 3D human bodies** with fancy clothes **in 3-8 seconds** using **Azure Kinect.**
- Achieved **SOTA performance** on capturing **accurate and detailed** human shapes with **complex cloth structures**.
- Advisor: Yebin Liu | Publication: ***CVPR2020*** **(oral)** | Field: 3D Reconstruction, Digital Human | Key tools: C++, CUDA

Realistic Graphics Engine, *Graphics and Geometric Computing Group, Tsinghua*
- Built a simple render engine for mesh and parametric surfaces with **photon mapping** and **path tracing** algorithm.
- Enable terrain creation and rendering using OpenGL and OpenCV with self-created shaders and water wave simulation.
- Advisor: Yongjin Liu | Field: Computer Graphics, Rendering | Key tools: C++, Eigen, OpenGL, OpenCV

Publications (* indicates the first author)

[1] **Chuanyu Pan***, Guowei Yang, Taijiang Mu, Yukun Lai. "Generating Animatable 3D Cartoon Faces from Single Portraits" in the *Computer Graphics International (**CGI**)*, 2023 and *Virtual Reality & Intelligent Hardware (**VRIH**)* Journal.

[2] Weiyu Feng*, Seth Z. Zhao*, **Chuanyu Pan***, Adam Chang, Yichen Chen, Zekun Wang, Allen Y. Yang. "Digital Twin Tracking Dataset (DTTD): A New RGB+Depth 3D Dataset for Longer-Range Object Tracking Applications" in *the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), the 2nd Workshop Challenge on **Vision Datasets Understanding**,* 2023

[3] **Chuanyu Pan***, Yanchao Yang*, Kaichun Mo, Yueqi Duan, and Leonidas J. Guibas. “Object Pursuit: Building a Space of Objects via Discriminative Weight Generation” in ***ICLR**,* 2022

[4] Zhe Li, Tao Yu, **Chuanyu Pan**, Zerong Zheng, and Yebin Liu. “Robust 3D Self-portraits in Seconds” in *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2020 (Oral Presentation)