KAIYUE SHEN

B permit holder, no sponsorship required

◇ (+41) 76 817 2997 ◇ shenkaiyue1997@gmail.com ◇ skype-line.github.io

EDUCATION

ETH Zürich 2019 - 2022
M.S. in Electrical Engineering & Information Technology *GPA: 5.82 / 6*

University of Electronic Science and Technology of China 2015 - 2019
B.S. in Electronic Information Engineering *GPA: 91.5 / 100 (Rank: 1 / 285)*

WORK EXPERIENCE

Arbrea Labs AG Switzerland, Deep Learning Engineer May 2023 - present

- Improved the accuracy of Arbrea's Augmented Reality & 3D tools by redesigning the architecture of the deep feature learning model (Python), generating synthetic data (Blender), and enhancing low-level optimization with Ceres Solver (C++).
- Enhanced the efficiency and scalability of our fitting pipeline through better memory management, utilization of efficient data structures like BVH, and rewriting implementations such as ray casting.
- Developed a visualization and annotation tool with ModernGL for easier acquisition of 2D ground truth features, seamlessly integrating our geometry fitting pipeline in the background.
- Supervised 3 bachelor theses at ETHZ in the domains of human body pose and shape estimation, face alignment, and texture inpainting, all of which achieved successful defenses.

Advanced Interactive Technologies Lab, ETHZ, Research Assistant Nov. 2022 - Mar. 2023
The Electromagnetic Database of Global 3D Human Pose and Shape in the Wild (Co-Author, ICCV 2023)

- Leveraged model optimization experience from my master's thesis to enhance the multi-stage optimization pipeline used in dataset construction.
- Captured and processed 58 minutes of multi-modal motion data utilizing wireless electromagnetic sensors and a handheld iPhone, subsequently evaluating state-of-the-art monocular RGB methods on the collected dataset.

Seervision AG Switzerland, Computer Vision Engineer Intern September 2021 - March 2022

- Tested multiple state-of-the-art algorithms and deployed the best into the product codebase, significantly improving the mAP metrics of the person re-identification task.
- Generated a product-testing dataset and validated on SV-DOP server against various edge cases, leading to the discovery of influential factors for product design.

PROJECTS

X-Avatar: Expressive Human Avatars Apr. 2022 - Nov. 2022
Master Thesis (First Author, CVPR 2023) *Advanced Interactive Technologies Lab, ETHZ*

- Proposed and simulated a fully-controllable human avatar model using PyTorch, which can be learned from multiple input modalities: 3D scans, RGB-D data, etc.
- Built a coarse-to-fine registration pipeline that fits a parametric model to our motion-captured scans.
- Created a high-quality dataset of 35,500 textured scans capturing diverse body poses, hand gestures, and facial expressions from 20 clothed individuals.

Continual Learning for 2D Image Segmentation Oct. 2020 - Feb. 2021
Semester Project (Score: 5.75/6) *Autonomous Systems Lab, ETHZ*

- Built a U-Net that continually learns the foreground and background segmentation task using TensorFlow.
- Implemented several methods for continual learning: feature distillation, elastic weight consolidation, progress & compress, etc, achieving the best fusion with the image segmentation task.

- Evaluated on NYU dataset and obtained 89.19% segmentation accuracy on new task while maintaining 89.9% on old tasks.

3D Object Reconstruction Using Azure Kinect Mar. 2020 - July 2020
Course project of 3D Vision (Score: 5.75/6)

- Presented an object reconstruction pipeline based on existing SLAM frameworks, and a learning-based depth error compensation method for Time-of-Flight cameras using Python and C++.
- Demonstrated the effectiveness of our method using the Azure Kinect RGB-D camera, and showed better performance compared with the depth correction method adopted by BAD SLAM.

SKILLS

Programming: Python (PyTorch, TensorFlow, Scikit-Learn, Keras), C++, MATLAB
Tools & Software: Linux, Git, Docker, Blender
Hobbies: skiing, badminton, hiking, cycling, skating, cooking