<Libing Zeng>

PhD Student Annual Review Progress Report
May 2022

Research

I am interested in deep learning and computational photography. My current research is to reconstruct 3D scene with SVBRDF given several images using deep learning. Prior to this, I have worked on video de-noising, and video depth estimation, using deep neural networks and the corresponding paper is published at ICCP (International Conference on Computational Photography) and submitted to CGF (Computer Graphics Forum) respectively.

- Research 4 (Incoming Intern Project). Reconstruction of 3D dynamic scene from a monocular video is challenging. We are planning to combine the strengths of instant NeRF, Scene Flow, Layered Neural Representation to tackle the issue.

- Research 3. Reconstruction of 3D static scene with SVBRDF given several multi-view images is challenging. We are trying to combine the strengths of differentiable renderer and Style-GAN to solve this problem. Specifically, we can use Style-GAN to generate ingredient maps for SVBRDF and then use differential renderer to improve the quality of results.

- Research 2. Video depth estimation from monocular video. The Paper is submitted at CGF (Computer Graphics Forum).

- Research 1. Video denoising, Done.

Publications

Number of publications: <2> published, **<1>** accepted, **<1>** submitted

1. *Libing Zeng, Nima Kalantari, "Test-Time Optimization for Video Depth Estimation", submitted at CGF (Computer Graphics Forum).*
2. *Avinash Paliwal, Libing Zeng, Nima Kalantari, "Multi-Stage Raw Video Denoising with Adversarial Loss and Gradient Mask," International Conference on Computational Photography (ICCP), 2021.*

Goals for 2022-2023

- Goal 1 (degree requirements): I intend to complete courses requirement next year.

- Goal 2 (research). I intend to finish the projects of Reconstruction of 3D dynamic scene from a monocular video, and Reconstruction of 3D static scene with SVBRDF given several multi-view images.
- Goal 3 (publications): I intend to get the paper about video depth estimation published and submit the results of current two project to the top tier conferences, such as CVPR, Siggraph, Siggraph Asia, ECCV and ICCV. To complete this goal, I need to do the following: diving into the new sub-areas, coming up with new ideas and designing experiments to verify the ideas, generating superior results. These works are important for my research because they will be related to my dissertation, I'm hoping to get positive feedback from them.

- Goal 4 (professional activities). I intend to attend Siggraph 2022.