Jiahao Luo

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Education

University of California, Santa Cruz — **Santa Cruz, CA, USA**
Ph.D. in Computer Science and Engineering
advised by prof. Jame Davis and prof. Alex Pang — Sep 2021 - present

University of California, Santa Cruz — **Santa Cruz, CA, USA**
M.S. in Electrical and Computer Engineering — Sep 2018 - Jun 2020

Beijing University of Post and Telecommunications (BUPT) — **Beijing, China**
B.Eng. in Electronic Engineering — Sep 2014 - Sep 2018

Research Experience

Face-Splatting: Few-shot High-Quality Human Face View Synthesis and Reconstruction — **Sep 2023 - present**

- Lead the team. Propose Face-Splatting, an innovative 3D Gaussian Splatting model designed specifically for facial reconstructions using limited RGB inputs (typically only 1-3 views).
- Leverages a jointly-optimized face prior, which prioritizes the alignment and orientation of Gaussian points in accordance with the surface and normals derived from the face prior.
- Face-Splatting has already achieved state-of-the-art performance in both 3D reconstruction and novel view synthesis.

Disjoint Pose and Shape for 3D Face Reconstruction — **Jan 2022 - Jul 2023**

Related Publication:
Raja Kumar*, **Jiahao Luo***, Alex Pang, James Davis. Disjoint Pose and Shape for 3D Face Reconstruction
ICCV workshop 2023 (Co-first author)
Jiahao Luo, Eric Ruezga, James Davis. How accurate is 2-view stereo to reconstruct a 3D face model?
ICIP 2022

- Co-leaded the team. Proposed an end-to-end self-calibrated pipeline that disjointly estimates the camera pose from restricted views and reconstructs high-quality topologically consistent 3D with passive stereo and 3D morphable model (3DMM). Our pipeline outperforms state-of-the-art multi-view reconstruction methods by 15-20% on multiple datasets.

How much does input data type impact final face model accuracy? — **Mar 2021 - Jun 2022**

Related Publications:
Jiahao Luo, Fahim Hasan Khan, Issei Mori, Akila de Silva, Eric Sandoval Ruezga, Minghao Liu, Alex Pang, James Davis. How much does input data type impact final face model accuracy?
CVPR 2022 Oral presentation
Jiahao Luo, Fahim Khan, Issei Mori, Akila de Silva, Eric Ruezga, James Davis. Face Models: How good does my data need to be?
ICIP 2021

- Lead the team. Propose a careful analysis about 3D reconstruction accuracy and the type of input data including scan with missing regions, normal, texture, dense landmarks etc. and their combinations. e.g. a tiny amount of 3D information can significantly boost the results from a single image.
- Investigates the robustness of the reconstruction against noise and structured errors present in the input data.

DuelGAN: A Duel Between Two Discriminators Stabilizes the GAN Training — **May 2020 - May 2021**

Related Publications:
Jiaheng Wei, Minghao Liu, **Jiahao Luo**, Andrew Zhu, James Davis, Yang Liu, DuelGAN: A Duel Between Two Discriminators Stabilizes the GAN Training
ECCV 2022

- Helped propose DuelGAN, a multiple discriminators solution to improve the stability of generative adversarial network (GAN). DuelGAN employs a dual discriminator setup (D) along with Duel-GAME to maintain a delicate balance between agreement and disagreement. This strategic approach effectively mitigates model collapse during training, leading to better image quality.
- Conducted experiments on synthetic and real datasets, demonstrating that DuelGAN effectively addresses mode collapse and generates high-quality image samples compared to baseline work.

ChainGAN: Low-light image enhancement using chain-consistency network **Jan 2020 - Dec 2020**
Related Publication:
Minghao Liu, **Jiahao Luo**, Xiaohan Zhang, James Davis, Yang Liu. Low-light Image Enhancement Using Chain-consistent Adversarial Networks
ICPR 2022

- Co-lead the team. Proposed ChainGAN, a generative adversarial network (GAN) solution for low-light image enhancement. It achieves the best numerical and human evaluations performance compared to baseline deep learning methods and Gamma Correction.

Other publications
Ziren Wang, Jinchun Gao, Hafiz Muhammad Bilal, **Jiahao Luo**, Xiaoming Li. Impedance Compensation of the Welding Area of the RF Connector and Microstrip Line
ICCCAS 2018

Intern Experience

Regressing 3D human face shape from RGB images, Computer vision engineer intern **Oct 2020 - Aug 2021**
Bellus3D (later bought by Meta) | Mentor: Eric Chen

- Proposed a VGG-based 3D human face reconstruction neural network from only RGB images to assist water-tight, high-accuracy (less 0.3mm MAE) mobile capture of human face.
- Reduce the dependence and later replace depth sensors of the iPhone front camera, and facilitate the development of an Android application.

Assistant product manager **Mar 2018 - Jun 2018**
Bianlifeng | Mentor: Xinglong Fan

Skills

Python	PyTorch3D	PyTorch
MATLAB	OpenCV	Open3D
Team Leadership	Project Communication	Program Managemen

Award

- **CVPR 2022 Oral presentation** **Jun 2022**
- **UCSC Chancellor's fellowship** **Mar 2021**

Class projects

Light direction estimation for Reflectance Transformation Imaging (RTI)	2019.09-2019.12
A survey about GAN-based anomaly detection	2019.07-2019.08
Image salient region detection using entropy analysis	2019.04-2019.06
Car-GAN: a modified GAN model generating car images from edges	2019.01-2019.04