

# Minghao Liu

55 Silcreek Dr, San Jose, CA 95116 | (814) 384-2833 | mliu40@ucsc.edu

## EDUCATION

University of California, Santa Cruz

Sep 2019—Present

*Ph.D. in Computer Science and Engineering (Advanced to candidacy)*

University of California, Santa Cruz (UCSC)

Sep 2015—Jun 2019

*B.S. in Computer Science and B.A. in Business Management Economics*

## RESEARCH EXPERIENCES

Avatar creation:CVG-Research Intern and Paper collaboration

June 2021—Dec 2022

ByteDance | Mentor: Jing Liu and Dr. James Davis

Mountain View, CA

- Proposed a self-supervised method for avatar auto-creation system, which can generate editable fine-grained cartoon avatars based on the human input image. (SIGGRAPH Asia 2022) [Year 1]
- Utilized GAN-based stylization methods to conquer the domain gap between input and target domains and used a neural imitator to solve the non-differentiable issue in rendering systems. [Year 1]
- Introduced novel tagging-based annotation methods for human-cartoon annotations, the proposed annotation method provides better quality, less annotator confusion, and can expand to another rendering system with limited cost. [Year 2 Summer]
- Conducted human user studies using internal annotation teams and Amazon Turkers, reduced annotators' confusion by designing excellent interfaces and conducted fair and consistent reports for method comparisons. [Year 1&2]

Human in the loop

Jan 2022—Present

UC Santa Cruz | PI: Dr. James Davis and Dr. Yang Liu

Santa Cruz, CA

- Conducted experiments on comparing machine algorithms to human annotators on classification tasks, understand the strength and weakness from both sides, and proposed a hybrid mode to combine human-machines, which achieves significant performance boost.
- Conducted statistical comparisons on prediction distributions of human and machines, resulting an efficient utilization of them.

DuelGAN: A Duel Between Two Discriminators Stabilizes the GAN Training

May 2019—May 2022

UC Santa Cruz | PI: Dr. James Davis and Dr. Yang Liu

Santa Cruz, CA

- Proposed DuelGAN, a generative adversarial net (GAN) solution, to improve the stability of the generated images and to mitigate mode collapse during GAN training. (ECCV 2022)
- DuelGAN utilized two discriminators (D) and Duel-GAME to balance the agreement and disagreement between the two D.
- Experimental results on a synthetic dataset validate that DuelGAN addresses mode collapse. Results on real datasets demonstrate that DuelGAN generates high-quality image samples compared with baseline work.
- The proposal Duel-GAME was able to serve as a regularizer and applied to other GAN models such as StyleGAN-ADA.

Low-light image enhancement

Sep 2019 — March 2022

UC Santa Cruz | PI: Dr. James Davis and Dr. Yang Liu

Santa Cruz, CA

- Used a self-supervised method ChainGAN for low light image enhancement. ChainGAN generated images with the best MSE, SSIM, and PSNR values, and were the most preferred method in human evaluations when compared with baseline methods such as CycleGAN and Gamma Correction. (ICPR 22)

## PUBLICATIONS

Minghao Liu, Zeyu Cheng, Shen Sang, Jing Liu, James Davis, *Tagging-based annotation system for avatar creation.* (Under review [CVPR 2023](#))

Minghao Liu\*, Jiaheng Wei\*, Yang Liu, and James Davis, *Human-machine perception difference makes hybrid classification systems more robust on the noisy label.* (Under preparation)

Jiaheng Wei\*, Minghao Liu\*, Jiahao Luo, Qitong Li, James Davis, and Yang Liu. [DuelGAN: A Duel Between Two Discriminators Stabilizes the GAN Training.](#) (ECCV 2022) (Co-first author)

Minghao Liu, Jiahao Luo, Xiaohan Zhang, Yang Liu, and James Davis. *Low-light Image Enhancement Using Chain-consistent Adversarial Networks.* (ICPR 2022)

Shen Sang, Tiancheng Zhi, Guoxian Song, Minghao Liu, Chunpong Lai, Jing Liu, Linjie Luo, Xiang Wen, and James Davis. *AgileAvatar: Stylized 3D Avatar Creation via Cascaded Domain Bridging.* (SIGGRAPH Asia 2022)

Jiahao Luo, Fahim Khan, Issei Mori, Akila de Silva, Eric Sandoval Ruezga, Minghao Liu, Alex Pang, and James Davis. *How much does input data type impact final face model accuracy?* (CVPR 2022)

## Other experience

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**Teaching Assistant** *UC Santa Cruz*

**Sep 2017—Mar 2018; Sep 2020—Present**

- Organized weekly discussion sections and exam review sections to explain complex concepts, answered students' questions, made timely course announcements, and proctored exams.
- Served as an efficient liaison between the professor and students; communicated weekly with the professor to discuss students' feedback for the course.

**Computational Fluid Dynamic Research Intern**

**Sep 2018—July 2019**

*UC Santa Cruz | PI: Dr. Dong Wook Lee*

*Santa Cruz, CA*

- Studied concepts in computational fluid dynamics; extrapolated physical changes of fluid substances by implementing physical laws as partial differential equations in Python and MATLAB
- Implemented and compared the state-of-the-art methods in fluid dynamics, and demonstrated the differences in accuracy and computation power consumption among methods with various mathematical orders
- Compared methods with different mathematical orders and scientifically proofed the accuracy and efficiency of different methods

**Web development intern**

**June 2018—Sep 2018**

*Yuanhe Tech Inc.*

*Zhongshan, Guangdong*

- Led a team of four interns using spring framework to develop a web app managerial system for a house rental company.
- Participated in the development of a software similar to Yelp by adding new features to the admin managerial platform.

## Skills

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- Machine learning related coding: Python, PyTorch, Numpy, Matplotlib, openCV, pip, Conda.
- Data and human evaluation related coding: HTML, JS, Amazon Mechanical Turk