Andrew Hou

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RESEARCH INTERESTS

Portrait relighting/delighting, shadow modeling/removal, relightable avatars, AR/VR, digital humans, face modeling/editing, neural rendering, 3D representations (e.g. Gaussian splatting, NeRF), generative AI.

PROFESSIONAL EXPERIENCE

07/2024 - Present **Research Scientist at Meta Reality Labs**
- XRCIA: Extended Reality Codec Interactions and Avatars team
- Relightable avatars, portrait/image delighting (face and body)
- Delivered a robust, generalizable generative delighting model (flow matching) for capture images
- Delivered an effective super resolution model that improved clothing textures and accessories
- Designed several innovative skin tone evaluation metrics that measured skin tone correctness, skin tone uniformity, delighting performance, and skin tone consistency (among capture images)

04/2020 - 06/2024 **Industry Collaboration with Qualcomm**
- Mentors: Drs. Michel Sarkis and Ning Bi
- Worked on face relighting projects (CVPR 2021/2022) with an emphasis on hard shadow modeling.
- Worked on improving NeRF's representation power for multi-subject 3D face modeling (INFAMOUS-NeRF) and in efficient, high fidelity gaussian head avatars (EGGHead).

05/2023 - 09/2023 **Research Intern at Adobe**
- Mentors: Drs. Zhixin Shu, Cecilia Zhang, He Zhang, Yannick Hold-Geoffroy, and Jae Shin Yoon
- Controllable portrait shadow editing that cleanly modifies only shadow attributes (intensity, shape, position) while preserving other light attributes, COMPOSE was accepted to ECCV 2024.

06/2022 - 08/2022 **Research Intern at Bosch**
- Mentors: Drs. Xinyu Huang, Liu Ren, Yuliang Guo, and Ruoyu Wang.
- Worked on improving cross-domain monocular 3D object detection performance.

06/2021 - 08/2021 **Research Intern at Bosch**
- Mentors: Drs. Xinyu Huang and Liu Ren.
- Achieved state of the art facial foreign shadow removal given a single portrait image (BMVC 2022)

EDUCATION

08/2019 – 08/2025 **PhD in Computer Science**, Michigan State University
Advisor: Dr. Xiaoming Liu
Committee: Xiaoming Liu (chair), Yiying Tong, Arun Ross, Daniel Morris, Michel Sarkis
Dissertation: Face Modeling Under Diverse Illuminations
Research Areas: Face Relighting, 3D Face Modeling, Neural Rendering, Generative AI
Graduate GPA: 3.95/4.0

09/2014 – 05/2018 **Sc.B. with Honors in Applied Mathematics and Computer Science**, Brown University
Honors Thesis: Light Field Super Resolution Using Convolutional Neural Networks
Advisor: Dr. James Tompkin
GPA: 3.58/4.0 (Major GPA: 3.64/4.0)

08/2013-05/2014 Clarkson University
The Clarkson School Early College Entrance Program
Major: Electrical Engineering and Computer Science
GPA: 3.79/4.0 (Major GPA: 3.74/4.0)

PUBLICATIONS

1. **Andrew Hou***, Pilseo Park*, Michel Sarkis, Ning Bi, Yiying Tong, and Xiaoming Liu, "EGGHead: Efficient Generalizable Gaussian Head Avatars from a Single Image," in review. (* denotes equal contribution) [PDF]

2. **Andrew Hou**, Zhixin Shu, Xuaner Zhang, He Zhang, Yannick Hold-Geoffroy, Jae Shin Yoon, and Xiaoming Liu, "COMPOSE: Comprehensive Portrait Shadow Editing," ECCV 2024. [PDF]
3. **Andrew Hou**, Feng Liu, Zhiyuan Ren, Michel Sarkis, Ning Bi, Yiying Tong, and Xiaoming Liu, "INFAMOUS-NeRF: ImproviNg FAce MOdeling Using Semantically-Aligned Hypernetworks with Neural Radiance Fields," arxiv 2023. [PDF]
4. Jingwen Shi, Tian Xie, Guan-Hua Tu, Chunyi Peng, Chi-Yu Li, **Andrew Hou**, Sihan Wang, Yiwen Hu, Xinyu Lei, Min-Yue Chen, Li Xiao, and Xiaoming Liu. "When Good Turns Evil: Encrypted 5G/4G Voice Calls Can Leak Your Identities," CNS 2023. [PDF]
5. Yaojie Liu*, **Andrew Hou***, Xinyu Huang, Liu Ren, and Xiaoming Liu, "Blind Removal of Facial Foreign Shadows," BMVC 2022. (* denotes equal contribution) [PDF]
6. **Andrew Hou**, Michel Sarkis, Ning Bi, Yiying Tong, and Xiaoming Liu, "Face Relighting with Geometrically Consistent Shadows," CVPR 2022. [PDF]
7. **Andrew Hou**, Ze Zhang, Michel Sarkis, Ning Bi, Yiying Tong, and Xiaoming Liu, "Towards High Fidelity Face Relighting with Realistic Shadows," CVPR 2021. [PDF]
8. Jiaju Huang, Daqing Hou, Stephanie Schuckers, and **Zhenhao Hou**, "Effect of data size on performance of free-text keystroke authentication," ISBA 2015. [PDF]

PATENTS

1. Zhixin Shu, **Andrew Hou**, He Zhang, Xuaner Zhang, Yannick Hold-Geoffroy, Jae Shin Yoon "Editing Shadows in Digital Images Utilizing Machine Learning Models," U.S. Serial No. 18/651,176, filed on April 30, 2024. [link]

TECHNICAL SKILLS

1. Languages: Python, Matlab, Java, C++, C#, C, R, HTML, CSS, Javascript, JQuery, PHP, Bash, Scala, Racket, OCaml
2. Deep Learning Frameworks: PyTorch, TensorFlow
3. Other: Linux, MacOS, Windows, Microsoft Office, LaTeX (Overleaf), Github, Unity, ROS

AWARDS & HONORS

05/2025	Outstanding Reviewer, CVPR 2025 (711 out of 12,593 reviewers, top 5%) [link]
08/2023	Data and Research Translation Award (2nd place, sponsored by Jackson, MSU EGRS)
08/2023	Best Poster Award (MSU Engineering Graduate Research Symposium)
04/2022	Best Poster Award (MSU Engineering Graduate Research Symposium, AI/Big Data Category)
04/2019	University Distinguished Fellowship (20 out of 500 incoming MSU PhD students)
05/2013	Presidential Scholarship (5 out of 80 Clarkson School students)

TEACHING EXPERIENCE

09/2020 – 12/2021	Graduate Computer Vision Assignment Grader for Fall 2020, 2021, and 2022 (MSU, CSE 803)
09/2017 – 12/2018	Deep Learning Teaching Assistant for Fall 2017 and Fall 2018 (Brown, CSCI 1470)
01/2018 – 05/2018	Machine Learning Teaching Assistant (Brown, CSCI 1420)
09/2017 – 12/2017	Computer Vision Teaching Assistant (Brown, CSCI 1430)
06/2017 – 08/2017	Applied Ordinary Differential Equations Teaching Assistant (Brown, APMA 0350)

SERVICES & ACTIVITIES

1. Reviewer: CVPR 2022-2025, ECCV 2024, ICCV 2023/2025, SIGGRAPH 2023-2024, NeurIPS 2024-2025, ICLR 2025, ICML 2025, AAAI 2026, WACV 2026, BMVC 2022, TPAMI, TIP, TVCG, PR Letters.
2. Mentored students: Anh Dao (MSU undergrad, face relighting), ZiAng Gu (MSU undergrad, NeRF/3D Vision), Katherine Chen (High school student -> now at CMU, lighting estimation)

LANGUAGES & ADDITIONAL SKILLS

1. (English, Chinese)-Native/Bilingual Proficiency; (Japanese, Spanish, Latin)-Elementary Proficiency
2. Highly effective presenter with strong public speaking and communication skills.