Yaojie Liu

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RESEARCH INTERESTS

Face/Biometrics, VLM/MLLM, Distillation, Domain Adaptation/Generalization, XAI, Out-of-distribution (OOD), Mobile Vision

EXPERIENCE

Senior Research Scientist, Tech Lead, Google — *04/2023 - present*
- Launch Face Unlock on Pixel 7a & Pixel Fold & Pixel 8/8 Pro as Class 3 (Strong)
- Launch Face Unlock on Pixel 8a & Pixel Fold 2& Pixel 9/9 Pro as Class 3 (Strong)
- Launch Face Unlock on Pixel 9a & Pixel 10/10 Pro/Fold as Class 3 (Strong)
- Youtube User Verification

Research Scientist, Google Research — *06/2021 - 04/2023*
- Launch Face Unlock on Pixel 7 & Pixel 7 Pro

Research Intern, HMI, Robert Bosch LLC — *06/2020 - 08/2020*
- Mentors: Xinyu Huang, Liu Ren
- Project: Face Shadow Removal/Relighting

Research Intern, AI Research, Apple — *05/2019 - 08/2019*
- Mentors: Barry Theobald, Nicholas Apostoloff
- Project: Audio-Visual Modeling

EDUCATION

Ph.D., Computer Science, Michigan State University, USA — *05/2016 - 05/2021*
- Advisor: Xiaoming Liu
- Committee: Xiaoming Liu (chair), Anil Jain, Arun Ross, Daniel Morris
- Dissertation: Face Anti-Spoofing: Detection, Generalization, and Visualization

M.S., Computer Science, Ohio State University, USA — *08/2014 - 05/2016*
- Advisor: Aleix Martinez
- Project: Global and Local Fitting of Facial Landmarks and Action Units

B.E., Communication Engineering, UESTC, China — *08/2010 - 05/2014*
- Advisor: Chang Shu
- Thesis: Image Inpainting

PUBLICATIONS

I have >3500 citations according to Google Scholar, and my **h-index** is 15. (* denotes equal contribution)

Conference Papers:

1. Baiyu Su, **Yaojie Liu**, Chengzhi Mao, Wen-Sheng Chu, "Student May Think Differently: Distillation with Reasoning Reinforced," *submitted to conference*, 2025.

2. Qihao Liu, Chengzhi Mao, **Yaojie Liu**, Alan Yuille, Wen-Sheng Chu, "Differences That Matter: Auditing Models for Capability Gap Discovery and Rectification," *submitted to conference*, 2025. [PDF, Project]

3. Ziqian Lin, **Yaojie Liu**, Runze Li, Yujia Chen, Yixuan Li, Wen-Sheng Chu, "OOD Learner via In-Context Learning," *submitted to conference*, 2025.

4. Yiyou Sun, **Yaojie Liu**, Xiaoming Liu, Yixuan Li, Wen-Sheng Chu, "Rethinking Domain Generalization for Face Anti-spoofing: Separability and Alignment," *IEEE Computer Vision and Pattern Recognition (CVPR)*, 2023. (25% Acceptance Rate) [PDF, Code]

5. **Yaojie Liu***, Andrew Hou*, Xinyu Huang, Liu Ren, Xiaoming Liu, "Blind Removal of Facial Foreign Shadows," *Proc. British Machine Vision Conference (BMVC)*, 2022. [PDF, Code, Demo]

6. Xiao Guo, **Yaojie Liu**, Anil Jain, Xiaoming Liu, "Multi-domain Learning for Updating Face Anti-spoofing Models," *Proc. European Conference of Commmputer Vision (ECCV)*, 2022. (**Oral, 2.7% Acceptance Rate**). [PDF, Code]

7. Hsin-Ping Huang, Deqing Sun, **Yaojie Liu**, Wen-Sheng Chu, Taihong Xiao, Jinwei Yuan, Hartwig Adam, Ming-Hsuan Yang, "Adaptive Transformers for Robust Few-shot Cross-domain Face Anti-spoofing," *Proc. European Conference of Commputer Vision (ECCV)*, 2022. (20% Acceptance Rate). [PDF, Code]

8. **Yaojie Liu**, Jeol Stehouwer, Xiaoming Liu, "On Disentangling Spoof Traces for Generic Face Anti-Spoofing," *Proc. European Conference of Commputer Vision (ECCV)*, 2020. (26% Acceptance Rate) [PDF, Code, Short Video, Long Video]

9. Jeol Stehouwer, Amin Jourabloo, **Yaojie Liu**, Xiaoming Liu, "Noise Modeling, Synthesis and Classification for Generic Object Anti-Spoofing," *IEEE Computer Vision and Pattern Recognition (CVPR)*, 2020. (25% Acceptance Rate) [PDF, Code, Data, Short Video]

10. **Yaojie Liu**, Jeol Stehouwer, Amin Jourabloo, Xiaoming Liu, "Deep Tree Learning for Zero-shot Face Anti-spoofing," *IEEE Computer Vision and Pattern Recognition (CVPR)*, 2019. (**Oral, Best Paper Finalist, 5.6% Acceptance Rate.**) [PDF, Code, Data, Video, Poster]

11. **Yaojie Liu***, Amin Jourabloo*, Xiaoming Liu, "Face De-Spoofing: Anti-Spoofing via Noise Modeling," *Proc. European Conference of Commputer Vision (ECCV)*, 2018. (31.8% Acceptance Rate) [PDF, Code, Poster]

12. **Yaojie Liu***, Amin Jourabloo*, Xiaoming Liu, "Learning Deep Models for Face Anti-Spoofing: Binary or Auxiliary Supervision," *IEEE Computer Vision and Pattern Recognition (CVPR)*, 2018. (30% Acceptance Rate) [PDF, Data, Poster]

13. **Yaojie Liu**, Amin Jourabloo, William Ren, Xiaoming Liu, "Dense Face Alignment," *International Conference on Computer Vision (ICCVW) Workshop on Analysis and Modeling of Faces and Gestures (AMFG)*, 2017. [PDF, Code, Poster]

14. **Yaojie Liu***, Yousef Atoum*, Amin Jourabloo*, Xiaoming Liu, "Face Anti-Spoofing Using Patch and Depth-Based CNNs," *IEEE International Joint Conference on Biometrics (IJCB)*, 2017. [PDF, Poster]

15. Ruiqi Zhao, Yan Wang, C.F. Benitez-Quiroz, **Yaojie Liu**, A.M. Martinez, "Fast and Precise Face Alignment and 3D Shape Reconstruction from a Single 2D Image." *European Conference on Computer Vision Workshop (ECCVW)*, 2016. [PDF]

16. **Yaojie Liu**, Chang Shu, "A Comparison of Image Inpainting Techniques." *International Conference on Graphic and Image Processing (ICGIP)*, 2015. [Link]

Journal Papers:

17. Xiaohong Liu, **Yaojie Liu**, Jun Chen, Xiaoming Liu, "PSCC-Net: Progressive Spatio-Channel Correlation Network for Image Manipulation Detection and Localization," in IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), doi:10.1109/TCSVT.2022.3189545, 2022. [PDF]

18. **Yaojie Liu**, Xiaoming Liu, "Spoof Trace Disentanglement for Generic Face Anti-Spoofing" in IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI), doi:10.1109/TPAMI.2022.3176387, 2022. [PDF]

19. Chang Shu, **Yaojie Liu**, "Inpainting: Survey and Experiments" International Journal of Signal Processing, Image Processing and Pattern Recognition, Vol. 9, Issue. 10, pp. 21-36, 2016. [Link]

20. **Yaojie Liu**, Chang Shu, Zhizhong Fu "Dynamic Gesture Localization and Recognition Algorithm Based on Skeletonization" Electronic Science and Technology, Vol. 3, pp. 005, 2014. (in Chinese) [Link]

Book Chapters:

21. **Yaojie Liu**, Jeol Stehouwer, Amin Jourabloo, Xiaoming Liu, "Presentation Attack Detection for Face in Mobile Phones" Selfie Biometrics, Ajita Rattani, Reza Derakhahani, and Arun Ross, Springer, 2019. [PDF]

PATENT

- **Yaojie Liu**, Wen-Sheng Chu, Manli Shu "Material Classification with Conditional Diffusion Models," U.S. Serial No. 63/549,265, filed on Feb 02, 2024.

- Soyoung Péraud, Wen-Sheng Chu, **Yaojie Liu**,"Detecting Out-of-Distribution Use Cases in an Object Classification System," Serial No. PCT/US2023/034282, filed on Oct 02, 2023.

- **Yaojie Liu**, Wen-Sheng Chu, "Large-Model Copilot: A System to Boost Generalization of Smaller Models," Serial No. PCT/US2023/0760926, filed on Oct 05, 2023.

- **Yaojie Liu**, Wen-Sheng Chu, "Multi-Scale Model Ensemble for Classification of Objects," U.S. Serial No. 18/150,426, filed on Jan 05, 2023.

- **Yaojie Liu**, Amin Jourabloo, Xiaoming Liu, "Improved Spoof Detection for Facial Recognition," U.S. Serial No. 62/626,486, filed on Feb 05, 2018.

Honors & Awards

- ECCV 2022 Outstanding Reviewer Award (205 selected from 4,719 reviewers)   *2022*
- CVPR 2021 Outstanding Reviewer Award (1063 selected from 5,246 reviewers)   *2021*
- Fitch Beach Award nominee (one winner in entire CSE department), MSU   *2021*
- Outstanding Graduate Student Award, CSE Department at MSU   *2021*
- ECCV 2020 Outstanding Reviewer Award (215 selected from 2,830 reviewers)   *2020*
- College of Engineering Dissertation Completion Fellowship, MSU   *2020*
- CVPR 2019 Best Paper Finalist (45 selected from 1,294 accepted papers)   *2019*
- Honorable Mention, Engineering Graduate Research Symposium, MSU   *2018*
- College of Engineering Distinguished Fellowship, MSU   *2016*
- Best Bachelor Thesis Award, UESTC   *2014*
- People´s Scholarship for Excellent University Student, UESTC   *2011-2013*

Professional Services

- **Area Chair**: BMVC´22
- **Co-Organizer/Lecturer**:
  - IJCB 2020 Tutorial, "Recent Advances on Detecting Face Spoofing and Face Manipulation", half-day. [1, 2, 3]
  - BTAS 2019 Tutorial, "Face Anti-Spoofing: Past, Present and Future", half-day. [1, 2, 3]
  - CVPR 2018 Demo, "Real-time Face Anti-spoofing System", full-day. [Link]
- **Conference Reviewer**: CVPR´19-25, ICCV´19-25, ECCV´20-24, NeurIPS´20-24, AAAI´20-22, ICML´21-23, ICLR´22, WACV´18-22, ACCV´20-22, BTAS´18, ICB´19, ICME´20-21, PRCV´19-20
- **Journal Reviewer**: TPAMI, IJCV, TIP, TIFS, CVIU, Neurocomputing, Pattern Recognition, JEI, Image and Vision Computing, TBIOM, TOMM, IET Computer Vision, IEEE Access, JCST
- **Mentoring/Intern Host**:

  Google
  - Baiyu Su (Summer 2025 - Fall 2025)
  - Qihao Liu (Summer 2025 - Fall 2025)
  - Ziqian Lin(Summer 2024 - Fall 2024)
  - Manli Shu (Summer 2023 - Fall 2023)
  - Yiyou Sun (Summer 2022 - Fall 2022)
  - Steven Grosz (Co-host, Summer 2021 - Fall 2021)
  - Hsin-Ping Huang (Co-host, Summer 2021 - Fall 2021)

  MSU
  - Xiao Guo (Summer 2021 - Fall 2021)
  - Xiaohong Liu (Summer 2020 - Fall 2020)
  - Xiaohan Zhang (Fall 2016 - Spring 2017)
  - William Ren (Summer 2016, Summer 2017)

Invited Talks

- Interview @ IEEE Biometrics Council Newsletter. [Link]   *6/2021*
- "Face Anti-Spoofing: Detect, Visualize, and Generalize", Sichuan University.   *1/2020*
- "Face Anti-Spoofing: Detect, Visualize, and Generalize", UESTC.   *1/2020*
- "Deep Tree Learning for Zero-shot Face Anti-spoofing", MSU/ND Vision Workshop.   *9/2019*
- "Deep Tree Learning for Zero-shot Face Anti-spoofing", Oral Presentation, CVPR.   *6/2019*
- "Dense Face Alignment", Midwest Vision Workshop.   4/2017

Technical Skills

- **Languages**: Python, C/C++, Java, Shell Script, Matlab, HTML, R
- **Tools**: Tensorflow, PyTorch, Caffe, Apache Beam, Git, OpenCV, LaTeX
- **Systems**: Linux, MacOS, Windows