

# Yaojie Liu

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## CONTACT INFORMATION

Department of Computer Science and Engineering,  
Michigan State University,  
East Lansing, MI 48824, USA

*E-mail:* [liuyaoj1@msu.edu](mailto:liuyaoj1@msu.edu)  
*Phone:* (614)-886-6885  
*Web:* [www.cse.msu.edu/~liuyaoj1/](http://www.cse.msu.edu/~liuyaoj1/)

## JOB INTERESTS

I'm actively looking for a full-time position in 2021 Spring in the area of computer vision and deep learning. If you are interested in my background, please don't hesitate to contact me.

## RESEARCH INTERESTS

Computer Vision, Deep Learning, Face Analysis, Synthesis, Biometrics, Low-level Vision, Audio-Visual Modeling, Image Forensic.

## EDUCATION

### Michigan State University, MI, USA

Ph.D. Candidate in Computer Science, May 2016 - May. 2021 (Expected)

- Dissertation Title: "Face Anti-Spoofing: Detection, Generalization, and Visualization"
- Advisor: Dr. Xiaoming Liu
- Thesis committee: Xiaoming Liu (chair), Anil Jain, Arun Ross, Daniel Morris
- GPA: 3.67/4

### The Ohio State University, OH, USA

M.S. in Computer Science, Sept. 2014 - Apr. 2016

- Research Title: "Global and Local Fitting of Facial Landmarks and Action Units (AUs)"
- Advisor: Dr. Aleix Martinez
- GPA: 3.88/4

### University of Electronic Science and Technology of China, Sichuan, China

B.E. in Communication Engineering, Sept. 2010 - Apr. 2014

- Dissertation Title: "Image Inpainting"
- Advisor: Dr. Chang Shu
- GPA: 3.92/4

## RESEARCH HIGHLIGHTS

In the area of face anti-spoofing, I lead the R&D at our team, publish **7** papers, **1** under review, release **2** databases, file **1** patent, organize **2** half-day tutorials and **1** full-day demo. The papers receive overall **>400** citations, the databases are distributed to **>600** research groups, and our code receive **~300** stars & **86** forks on GitHub. In U.S. government-organized independent evaluation, our face anti-spoofing solution can achieve **98.4%** TDR at **0.2%** FDR and **1.0** AUC. Our research of face anti-spoofing is covered by MSUToday[[News](#)]. Here are some examples of our face anti-spoofing systems [[Video](#)].

## PUBLICATIONS

I have >500 citations according to [Google Scholar](#), and my h-index is 6. (\* denotes equal contribution)

### Conference Papers

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

2. 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) [\[PDF\]](#) [\[Code\]](#) [\[Database\]](#) [\[Short Video\]](#)
3. **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.**) [\[PDF\]](#) [\[Code\]](#) [\[Database\]](#) [\[Poster\]](#)
4. **Yaojie Liu\***, Amin Jourabloo\*, Xiaoming Liu, “Face De-Spoofing: Anti-Spoofing via Noise Modeling,” Proc. European Conference of Computer Vision (ECCV), 2018. (31.8% Acceptance Rate) [\[PDF\]](#) [\[Code\]](#) [\[Poster\]](#)
5. **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) [\[PDF\]](#) [\[Database\]](#) [\[Poster\]](#)
6. **Yaojie Liu**, Amin Jourabloo, William Ren, Xiaoming Liu, “Dense Face Alignment,” International Conference on Computer Vision (ICCV) Workshop on Analysis and Modeling of Faces and Gestures (AMFG), 2017. [\[PDF\]](#) [\[Code\]](#) [\[Poster\]](#)
7. **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. [\[PDF\]](#) [\[Poster\]](#)
8. 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. [\[PDF\]](#)
9. **Yaojie Liu**, Chang Shu, “A Comparison of Image Inpainting Techniques.” International Conference on Graphic and Image Processing (ICGIP), 2015. [\[Link\]](#)

### Journal Papers

10. **Yaojie Liu**, Xiaoming Liu, “Physics-Guided Spoof Trace Disentanglement for Generic Face Anti-Spoofing” under review in IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI), 2020.
11. 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, October 2016. [\[Link\]](#)
12. **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

13. **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, Eds, Springer-Verlag, 2019. [\[PDF\]](#)

WORKING  
EXPERIENCES

**Computer Vision Intern**

Bosch Research, Sunnyvale, CA  
Research topic: Face Shadow Removal/Relighting

May 2020 - Aug. 2020

**AI Research Intern**

Apple Inc., Cupertino, CA  
Research topic: Audio-visual Modeling

May 2019 - Aug. 2019

**Research Assistant**

Michigan State University, East Lansing, MI

May 2016 - Now

PROFESSIONAL  
SERVICES

**Co-Organizer/Lecturer**

- Half-day Tutorial, “Secure the Face System: Recent Advances on Detecting Face Spoof Attacks and Digital Face Manipulation ”@ International Joint Conference on Biometrics (IJCB), 2020
- Half-day Tutorial, “Face Anti-Spoofing: Past, Present and Future”@ International Conference on Biometrics: Theory Applications and Systems (BTAS), 2019
- Full-day Demo, “Real-time Face Anti-spoofing System” @ IEEE Computer Vision and Pattern Recognition (CVPR), 2018. [\[Link\]](#)

**Conference Reviewer**

- Computer Vision and Pattern Recognition (CVPR) 2019-2021
- International Conference on Computer Vision (ICCV) 2019
- European Conference of Commputer Vision (ECCV) 2020
- Conference on Neural Information Processing Systems (NeurIPS) 2020
- AAAI Conference on Artificial Intelligence (AAAI) 2020-2021
- Winter Conference on Applications of Computer Vision (WACV) 2021
- Asian Conference of Computer Vision (ACCV) 2020
- International Conference on Biometrics: Theory Applications and Systems (BTAS) 2018
- IAPR International Conference On Biometrics (ICB) 2019
- International Conference on Multimedia and Expo (ICME) 2020
- Chinese Conference on Pattern Recognition and Computer Vision (PRCV) 2019-2020

**Journal Reviewer**

- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2020
- IEEE Transactions on Image Processing (TIP) 2019-2020
- IEEE Transactions on Information Forensics and Security (TIFS) 2019-2020
- Computer Vision and Image Understanding (CVIU) 2019-2020
- Neurocomputing 2019-2020
- Journal of Electronic Imaging (JEI) 2020
- Image and Vision Computing 2020

- IEEE Transactions on Biometrics, Behavior, and Identity Science (TBIOM) **2020**
- ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM) **2019**
- IET Computer Vision **2019**
- IEEE Access **2019**
- Journal of Computer Science and Technology (JCST) **2018**

## Mentoring

- Xiaohong Liu (Ph.D. in C.S., 2020, McMaster University)
- Xiaohan Zhang (B.S. in C.S., 2017, Michigan State University)
- William Ren (High School Student, 2016)

## TALKS

- Invited talk, Sichuan University, China. **Jan. 2020**  
“Face Anti-Spoofing: Detect, Visualize, and Generalize”
- Invited talk, UESTC, China. **Jan. 2020**  
“Face Anti-Spoofing: Detect, Visualize, and Generalize”
- Invited talk, MSU/ND vision workshop, Notre Dame IN. **Sept. 2019**  
“Deep Tree Learning for Zero-shot Face Anti-spoofing”
- Oral Presentation, CVPR. **Jun. 2019**  
“Deep Tree Learning for Zero-shot Face Anti-spoofing”
- Invited talk, Midwest vision workshop, Chicago IL. **Apr. 2017**  
“Dense Face Alignment”

## HONORS AND AWARDS

- ECCV 2020 Outstanding Reviewer (215 selected from 2830 reviewers by Area Chairs) **2020**
- Awarded College of Engineering Dissertation Completion Fellowship, MSU **2020**
- CVPR 2019 Best Paper Finalist (45 selected from 1294 accepted papers) **2020**
- Honorable Mention, Engineering Graduate Research Symposium, MSU **2018**
- Awarded College of Engineering Distinguished Fellowship, MSU **2016**
- Best Bachelor Thesis Award, UESTC **2014**
- First Rank, People’s Scholarship for Excellent Student, China **2013**
- Second Rank, People’s Scholarship for Excellent Student, China **2012**
- Research fund from Institute of Electronic Science and Technology, UESTC **2012**
- Research fund from Undergraduate Innovation Foundation, UESTC **2011**
- First Rank, People’s Scholarship for Excellent University Student, China **2011**

## PATENTS

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

## SKILLS

- Programming Language: Python, C/C++, Java, Git, Bash, HTML, SQL, R, L<sup>A</sup>T<sub>E</sub>X, Lisp
- Operating Systems: Linux, MacOS, Windows
- Signal Processing: Matlab
- Computer Vision Library: OpenCV
- Deep Learning: Tensorflow, PyTorch, MatConvNet, Caffe.