Felix Juefei Xu

Curriculum Vitae

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Education

2011 - 2018	 Ph.D. in Electrical and Computer Engineering, Carnegie Mellon University. Department of Electrical and Computer Engineering, College of Engineering Advisor: Prof. Marios Savvides Dissertation: Unconstrained Periocular Face Recognition: From Reconstructive Dictionary Learning to Generative Deep Learning and Beyond
2012 - 2017	 M.S. in Machine Learning, Carnegie Mellon University. Machine Learning Department, School of Computer Science Advisor: Prof. Abhinav Gupta Additional thesis committee member: Prof. Ruslan Salakhutdinov
2009 - 2011	 M.S. in Electrical and Computer Engineering, Carnegie Mellon University. Department of Electrical and Computer Engineering, College of Engineering Advisor: Prof. Marios Savvides
2005 - 2009	B.S. in Electronic Engineering , <i>Shanghai Jiao Tong University</i> . Department of Electronic Engineering, School of Electronic Information and Electrical Engineering

2008 **Summer Session**, University of California at Berkeley. Haas School of Business and College of Engineering

Research Interests

Deep Learning, Computer Vision, Machine Learning, Adversarial Robustness, AI Safety.

Research Bio

Felix Juefei Xu (published under *F. Juefei-Xu*) received the Ph.D. degree in Electrical and Computer Engineering from Carnegie Mellon University. During his Ph.D studies, he was working in a research group specializing in pattern recognition, machine learning, computer vision, and image processing, especially as applied to the field of biometrics, at *Carnegie Mellon CyLab Biometrics Center* under the supervision of *Prof. Marios Savvides*.

His research in general is focused on a fuller understanding of deep learning where he is actively exploring new methods in deep learning that are **statistically efficient** and **adversarially robust** through the lens of perception. He is now heavily involved in pushing the boundary of robust vision/AI by creating high-realism degradationmimetic adversarial attacks, *i.e.*, adversarial motion/defocus blur, rain/haze, relighting/exposure/vignetting/shadow, *etc.*, and then devising tools to defend against them through an attempt to situate both *natural corruption robustness* and *adversarial robustness* problems under the same dome; creating cunning DeepFakes that are detection-evasive to foster the development of next-generation robust detectors of real-world video/audio DeepFakes; seeking robust learners by creating novel neural architectures and computational modules that are statistically efficient and adversarially robust. His Ph.D. work is primarily focused on tackling the Pose, Expression, Resolution, Illumination, and Occlusion (Perio) challenges for unconstrained periocular face recognition using shallow and deep discriminative and generative methods, especially under the dome of self-supervised predictive learning. He also has broader interests in pattern recognition, computer vision, machine learning, optimization, statistics, compressive sensing, and image processing. He is the recipient of multiple best/distinguished paper awards, including the **Best Poster Paper Award** of the *IEEE/IAPR International Joint Conference on Biometrics* (*IJCB*) in 2011, the **Best Paper Award** of the *IEEE International Conference on Biometrics: Theory, Applications and Systems* (*BTAS*) in 2015, the **Best Student Paper Award** of the *IEEE BTAS* in 2016, the **ACM SIGSOFT Distinguished Paper Award** of the *IEEE/ACM International Conference on Automated Software Engineering* (*ASE*) in 2018, and the **Best Student Paper Award** of the 14th Asian Conference on Computer *Vision* (*ACCV*) in 2018.

Publications (Google Scholar Profile)

Dissertation

[1] Felix Juefei-Xu, "Unconstrained Periocular Face Recognition: From Reconstructive Dictionary Learning to Generative Deep Learning and Beyond", *Ph.D. Dissertation, Carnegie Mellon University*, 2018.

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- [2] Sanbao Su, Nuo Chen, Felix Juefei-Xu, Chen Feng, and Fei Miao, "α-SSC: Uncertainty-Aware Camera-based 3D Semantic Scene Completion", arXiv preprint arXiv:2406.11021, 2024.
- [3] Xinxi Zhang, Song Wen, Ligong Han, **Felix Juefei-Xu**, Akash Srivastava, Junzhou Huang, Hao Wang, Molei Tao, and Dimitris N. Metaxas, "Spectrum-Aware Parameter Efficient Fine-Tuning for Diffusion Models", *arXiv preprint arXiv*:2405.21050, 2024.
- [4] Di Yang, Yihao Huang, Qing Guo, Felix Juefei-Xu, Xiaojun Jia, Run Wang, Geguang Pu, and Yang Liu, "Text Modality Oriented Image Feature Extraction for Detecting Diffusion-based DeepFake", arXiv preprint arXiv:2405.18071, 2024.
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- [13] Jinlong Li, Baolu Li, Zhengzhong Tu, Xinyu Liu, Qing Guo, Felix Juefei-Xu, Runsheng Xu, and Hongkai Yu, "Light the Night: A Multi-Condition Diffusion Framework for Unpaired Low-Light Enhancement in Autonomous Driving", Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
- [14] Jiayi Zhu, Qing Guo, Felix Juefei-Xu, Yihao Huang, Yang Liu, and Geguang Pu, "CosalPure: Learning Concept from Group Images for Robust Co-Saliency Detection", Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
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- [54] Yihao Huang, Felix Juefei-Xu, Run Wang, Qing Guo, Lei Ma, Xiaofei Xie, Jianwei Li, Weikai Miao, Yang Liu, and Geguang Pu, "FakePolisher: Making DeepFakes More Detection-Evasive by Shallow Reconstruction", ACM International Conference on Multimedia (ACM MM), 2020. (Oral Presentation)
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Professional Services

Area Chair Conference on Neural Information Processing Systems (NeurIPS) Reviewer International Journal of Computer Vision (IJCV), Springer Reviewer IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) Reviewer IEEE Transactions on Image Processing (TIP) Reviewer IEEE Transactions on Multimedia (TMM) Reviewer IEEE Transactions on Information Forensics and Security (TIFS) Reviewer IEEE Transactions on Software Engineering (TSE) Reviewer IEEE Transactions on Neural Networks and Learning Systems (TNNLS) Reviewer IEEE Transactions on Artificial Intelligence (TAI) Reviewer IEEE Transactions on Circuits and Systems for Video Technology (TCSVT) Reviewer IEEE Transactions on Industrial Informatics (TII) Reviewer IEEE Robotics and Automation Letters (RAL) Reviewer IEEE Access Reviewer Heliyon, Cell Press Reviewer Pattern Recognition (PR), Elsevier Reviewer Pattern Recognition Letters (PRL), Elsevier Reviewer Computer Vision and Image Understanding (CVIU), Elsevier Reviewer Neurocomputing (NEUCOM), Elsevier Reviewer Neural Networks (NEUNET), Elsevier Reviewer Digital Signal Processing (DSP), Elsevier Reviewer Forensic Science International: Digital Investigation (FSIDI), Elsevier

Reviewer Information Sciences (INS), Elsevier

- Reviewer Journal of Visual Communication and Image Representation (JVCI), Elsevier
- Reviewer Computer Methods and Programs in Biomedicine (CMPB), Elsevier
- Reviewer IET Image Processing (IPR)
- Reviewer SIAM Journal on Imaging Sciences (SIIMS)
- Reviewer IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- Reviewer IEEE International Conference on Computer Vision (ICCV)
- Reviewer European Conference on Computer Vision (ECCV)
- Reviewer Conference on Neural Information Processing Systems (NeurIPS)
- Reviewer International Conference on Machine Learning (ICML)
- Reviewer AAAI Conference on Artificial Intelligence (AAAI)
- Reviewer Asian Conference on Computer Vision (ACCV)
- Reviewer IEEE International Conference on Robotics and Automation (ICRA)
- Reviewer IEEE International Conference on Biometrics: Theory, Applications, and Systems (BTAS)
- Reviewer IEEE Winter Conference on Applications of Computer Vision (WACV)
- Reviewer IEEE International Conference on Image Processing (ICIP)
- Reviewer IEEE International Conference on Biometrics (ICB)
- Reviewer IEEE/IAPR International Joint Conference on Biometrics (IJCB)
- Reviewer IEEE International Conference on Identity, Security and Behavior Analysis (ISBA)

Awards

- 2018 Best Student Paper Award, the 14th Asian Conference on Computer Vision (ACCV)
- 2018 ACM SIGSOFT Distinguished Paper Award, IEEE/ACM International Conference on Automated Software Engineering (ASE)
- 2016 Best Student Paper Award, IEEE Eighth International Conference on Biometrics: Theory, Applications and Systems (BTAS)
- 2015 Best Paper Award, IEEE Seventh International Conference on Biometrics: Theory, Applications and Systems (BTAS)
- 2015 Best 10% Paper Award, IEEE International Conference on Image Processing (ICIP)
- 2015 Gold Prize, Edison Awards (group recognition of CMU CyLab Biometrics Center)
- 2011 Best Poster Paper Award, 2011 IEEE/IAPR International Joint Conference on Biometrics (IJCB)

Teaching Experience

- Fall 2016 18-794 Pattern Recognition Theory (partial), Carnegie Mellon University
- Fall 2015 18-794 Pattern Recognition Theory, Carnegie Mellon University
- Fall 2014 18-794 Pattern Recognition Theory, Carnegie Mellon University
- Fall 2013 18-794 Pattern Recognition Theory, Carnegie Mellon University
- Fall 2012 18-794 Pattern Recognition Theory, Carnegie Mellon University
- 2007 2009 Advanced English-Chinese Interpretation, Shanghai New Oriental School, New Oriental Education & Technology Group Inc. (NYSE:EDU)

Language Familiarity

English Credential of (English) Advanced Interpretation conferred by Shanghai Municipal Personnel Bureau
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Chinese Native Mandarin/Shanghainese speaker
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Computer Skills

Programming	Python, C/C++, Matlab
DL platforms	Torch, PyTorch, TensorFlow, Caffe, MXNet, Theano
OS	Linux, macOS, Windows
Advanced office tools	LaTeX, Adobe Dreamweaver, Adobe Illustrator, Adobe Photoshop, Adobe Premiere Pro, Adobe Audition