Zexi Jia | Curriculum Vitae

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Education

Peking University **Beijing, China**

Ph.D. in Intelligent Science (Machine Vision) *2020.09–2024.07*

National Key Laboratory of Visual and Auditory Information Processing

Advisor: Professor Jufu Feng

Fudan University **Shanghai, China**

M.Sc. in Computer Science (Computer Vision) *2017.09–2020.07*

Shanghai Key Laboratory of Data Science

Advisor: Professor Xiangdong Zhou

Fudan University **Shanghai, China**

B.Eng. in Software Engineering (Data Mining) *2011.09–2016.07*

Software Engineering Laboratory

Research Interests

Multimodal Learning & Vision-Language Models; **AIGC Safety & Copyright Protection**; **Biometric Recognition**.

Research

Tencent WeChat AI **Beijing, China**

Multimodal LLMs and AIGC *2023.07–Present*

- Led research on **AI-generated content (AIGC) detection** and **copyright protection**, co-developing deployable systems and public benchmarks that balance detection accuracy with latency and cost constraints in large-scale online services.
- Led the **design and implementation** of multimodal retrieval technologies deployed in the WeChat ecosystem, including **expression-sticker search** in the main client and an **image retrieval system** in WeChat Keyboard.
- Led the development of **WePoints**, a unified **generative-and-understanding** multimodal model with 8B and 16B parameter variants, introducing novel architectures that tightly couple generative and discriminative capabilities.
- Served as a core contributor to the open-source **POINTS1.5** foundation model (10B+ parameters), designing and implementing vision-language representation learning algorithms.
- Published as first author or corresponding author multiple papers on multimodal representation learning, cross-modal retrieval, and AIGC safety at **top-tier conferences**, and contributed several widely adopted benchmarks for AI-generated image detection and copyright protection.

Peking University **Beijing, China**

Fingerprint Recognition in Complex Scenes *2020.09–2023.07*

- Served as **lead algorithm developer** for a **new-generation national fingerprint recognition system**, now serving **over 1 billion daily users** nationwide and significantly enhancing public security identification capabilities across China.
- Developed fingerprint segmentation, enhancement, and matching algorithms for complex and low-quality fingerprints, delivering a **65% accuracy improvement** over the previous system in large-scale evaluations recognized by the Ministry of Public Security.
- Received **the highest award** from the Ministry of Public Security for exceptional contributions; research featured in prominent national media including **People's Daily** and **Guangming Daily** as a landmark advancement in national security technology.

Industry

Tencent **Beijing, China**

Senior Algorithm Researcher *2024.07–Present*

- Selected into Tencent's top-tier "**Qingyun Program**" (青云计划) for outstanding young researchers upon joining the company.
- Supported the training and scaling of the **WeLM** family of large language models, including data curation, training pipeline optimization, and production deployment.
- Designed and built LLM-based applications in the WeChat ecosystem, including a **shopping assistant** and **agent-style tools** for chat-log mining, knowledge extraction, and workflow automation.
- Received "**Outstanding**" performance ratings in the last two annual reviews.

MEGVII (Face++) Shanghai Research Institute **Shanghai, China**

Computer Vision Researcher *2020.01–2020.09*

- Contributed to the development of a **new retail system** that transformed a large convenience-store group from traditional operations to **fully automated, data-driven operations**.
- Developed a set of **demand forecasting and replenishment algorithms** for the new retail industry, including sales forecasting, saturation-based replenishment, out-of-stock prediction, product placement planning, and order evaluation, forming a reusable algorithm repository.

Internships

Huawei NOAH'S ARK LAB **Beijing, China**

CV Intern Researcher *2021.10–2023.06*

- Independently conducted research on **event-camera perception algorithms** for autonomous driving, focusing on semantic segmentation of event-camera images and pre-training model algorithms.
- Proposed a **posterior attention mechanism** and a new pre-training framework tailored for event cameras, achieving **state-of-the-art** semantic segmentation performance on mainstream event-camera datasets **DDD17** and **MVSEC**.
- Deployed related algorithms on HiSilicon chips and received commendations from multiple departments.
- **Honors:** Retained through Huawei's "**Genius Youth Program**" (天才少年计划).

Microsoft Research Asia **Beijing, China**

Summer Research Intern *2019.06–2019.10*

- Participated in a summer internship with the Multimedia Search and Mining group at Microsoft Research Asia.
- Performed **unsupervised clustering** on large-scale click graphs constructed from user queries and clicked URLs under the guidance of mentors.
- Trained a **click model** based on clustering results to evaluate video relevance while debiasing positional effects, re-ranking video positions and improving online metrics such as **NDCG** and **DCG** for video search.

Skills & Expertise

- **Research:** First-author publications in top venues (CVPR, ICCV, IEEE TIP, IEEE TIFS); expertise in multimodal learning, AIGC safety, biometric recognition, and experimental design.
- **Engineering:** Strong programming skills in coding; extensive experience with deep learning frameworks (PyTorch, TensorFlow) and building production-grade vision and multimodal systems at billion-user scale.
- **Leadership:** Led large-scale research and deployment projects, including a national fingerprint recognition system; supervised graduate students and interns; coordinated collaborations with Tencent, Huawei, Microsoft, and MEGVII.
- **Communication:** Fluent in English (TOEFL 102, IELTS 6.5) and Mandarin; experienced in delivering conference presentations and authoring technical papers.

Publications

First and Corresponding Papers

- **Jia, Zexi**, Huang, Chuanwei, Zhu, Yeshuang, Fei, Hongyan, Duan, Xiaoyue, Yuan, Zhiqiang, Deng, Ying, Zhang, Jiapei, Zhang, Jinchao*, Zhou, Jie. "Secret Lies in Color: Enhancing AI-Generated Images Detection with Color Distribution Analysis". *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.
- **Jia, Zexi**, Huang, Chuanwei, Zhu, Yeshuang, Fei, Hongyan, Yuan, Zhiqiang, Deng, Ying, Zhang, Jiapei, Zhang, Jinchao*, Zhou, Jie. "From Imitation to Innovation: The Emergence of AI's Unique Artistic Styles and the Challenge of Copyright Protection". *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- **Jia, Zexi**, Huang, Chuanwei, Zhu, Yeshuang, Fei, Hongyan, Deng, Ying, Yuan, Zhiqiang, Zhang, Jiapei, Zhang, Jinchao*, Zhou, Jie. "A Visual Leap in CLIP Compositionality Reasoning through Generation of Counterfactual Sets". *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- **Jia, Zexi**, You, K., He, W., Tian, Y., Feng, Y., Wang, Y., Jia, X., Lou, Y., Zhang, J., Li, G*. "Event-based Semantic Segmentation with Posterior Attention". *IEEE Transactions on Image Processing (TIP)*, vol. 32, pp. 1829–1842, 2023.
- **Jia, Zexi**, Huang, Chuanwei, Wang, Zheng, Fei, Hongyan, Wu, Song, Feng, Jufu*. "Finger Recovery Transformer: Towards Better Incomplete Fingerprint Identification". *IEEE Transactions on Information Forensics and Security (TIFS)*, vol. 19, pp. 1945–1958, 2024.
- **Jia, Zexi***, Huang, Chuanwei. "Automated Framework for Extracting and Restoring Minutiae from Low-Quality Fingerprints". *IEEE Signal Processing Letters (SPL)*, 2025.
- **Jia, Zexi**, Huang, Chuanwei, Wang, Zheng, Feng, Jufu*. "FingerSTR: Weak Supervised Transformer for Latent Fingerprint Segmentation". In *Proceedings of the IEEE International Joint Conference on Biometrics (IJCB)*, 2023.
- Huang, Chuanwei, **Jia, Zexi***, Fei, Hongyan, Zhu, Yeshuang, Yuan, Zhiqiang, Deng, Ying, Zhang, Jiapei, Duan, Xiaoyue, Zhang, Jinchao, Zhou, Jie. "MCID: Multi-aspect Copyright Infringement Detection for Generated Images". *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- Huang, Chuanwei, **Jia, Zexi***, Zhu, Yeshuang, Fei, Hongyan, Zhang, Jinchao, Zhou, Jie. "ArtFRD: A Fisher–Rao Mixture Metric for Generative Model Aesthetic Evaluation". *ACM International Conference on Multimedia (ACM MM)*, 2025. (Oral)
- Huang, Chuanwei, **Jia, Zexi***, Fei, Hongyan, Zhu, Yeshuang, Yuan, Zhiqiang, Deng, Ying, Zhang, Jiapei, Jiao, Fei, Zhang, Jinchao, Zhou, Jie. "Semantic to Structure: Learning Structural Representations for Infringement Detection". In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2025. (Oral)

Co-Authored Papers

- Bi, Hanbo; Yuan, Zhiqiang; **Jia, Zexi**; Zhang, Jiapei; Li, Chongyang; Luo, Peixiang; Deng, Ying; Duan, Xiaoyue; Zhang, Jinchao*. "F^2RVLM: Boosting Fine-grained Fragment Retrieval for Multi-Modal Long-form Dialogue with Vision Language Model". *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2026.
- Yuan, Zhiqiang, Zhang, Ting, Zhu, Yeshuang, Deng, Ying, Zhang, Jiapei, **Jia, Zexi**, Duan, Xiaoyue, Zhang, Jinchao, Zhou, Jie*. "WalkVLM: Aid Visually Impaired People Walking by Vision Language Model". *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.

- Fei, Hongyan, Huang, Chuanwei, Wu, Song, Wang, Zheng, **Jia, Zexi**, Feng, Jufu*. "Fingerprint Presentation Attack Detection by Region Decomposition". *IEEE Transactions on Information Forensics and Security (TIFS)*, vol. 19, pp. 1532–1547, 2024.
- Wu, Song; **Jia, Zexi**; Feng, Jufu*. "Minutiae-awarely Learning Fingerprint Representation for Fingerprint Indexing". In *Proceedings of the IEEE International Joint Conference on Biometrics (IJCB)*, 2022. (Oral)
- Huang, Chuanwei; Fei, Hongyan; **Jia, Zexi**; Wu, Song; Feng, Jufu*. "Fingerprint Presentation Attack Detection with Supervised Contrastive Learning". In *Proceedings of the IEEE International Joint Conference on Biometrics (IJCB)*, 2023.
- Fei, Hongyan; Huang, Chuanwei; Wang, Zheng; **Jia, Zexi**; Wu, Song; Feng, Jufu*. "CoRE: Clues on Rotated Edge for Fingerprint Presentation Attack Detection". In *Proceedings of the IEEE International Joint Conference on Biometrics (IJCB)*, 2023.
- Wu, Song; **Jia, Zexi**; Feng, Jufu*. "Fingerprint Indexing with Minutiae-aided Fingerprint Multiscale Representation". In *Proceedings of the Asian Conference on Pattern Recognition (ACPR)*, 2023.
- Liu, Bing; Wang, Zheng; **Jia, Zexi**; Feng, Jufu*. "PalmNet: A Robust Palmprint Minutiae Extraction Network". In *Proceedings of the Asian Conference on Pattern Recognition (ACPR)*, 2021.
- Wang, Zheng; **Jia, Zexi**; Feng, Jufu*. "A Semantic Segmentation Method for Overlapping Fingerprints". *IEEE Signal Processing Letters (SPL)*.
- Tian, Yinjie; **Jia, Zexi**; Zhou, Xiangdong; Shi, Bolun*. "Infrared Image Object Detection of High Voltage Power Equipment Based on Hough Transform and Convolutional Network". *Computer Applications and Software*, January 2020.

Under Review

- **Jia, Zexi**; Yuan, Zhiqiang; Duan, Xiaoyue; Zhang, Jinchao; Zhou, Jie; Jain, Anil K.* "CoDA: Color Distribution Analysis for AI-Generated Image Detection". *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) Submission.*
- **Jia, Zexi**; Zhang, Jinchao; Zhou, Jie. "GCU: Bridging Clustering and Generation via Cycle-Consistent Unsupervised Diffusion". *CVPR 2026 Conference Submission.*
- **Jia, Zexi***; Luo, Pengcheng; Zhong, Yijia; Zhang, Jinchao; Zhou, Jie. "Evaluating Generative Models via One-Dimensional Code Distributions". *CVPR 2026 Conference Submission.*
- Fang, Zhengyao; **Jia, Zexi***; Zhong, Yijia; Luo, Pengcheng; Zhang, Jinchao; Lu, Guangming; Yu, Jun; Pei, Wenjie. "Assessing and Enhancing Color Authenticity in Generated Images: A Benchmark and Plug-and-Play Framework". *CVPR 2026 Conference Submission.*
- Luo, Pengcheng; **Jia, Zexi***; Zhong, Yijia; Zhang, Jinchao; Zhou, Jie. "GROW: Watermark Generation with Progressive Guidance for Diffusion Models". *CVPR 2026 Conference Submission.*
- Fei, Hongyan; **Jia, Zexi***; Huang, Chuanwei; Zhang, Jinchao; Zhou, Jie. "Detecting Fake Face Generation via Analysis of Illumination Reflection Patterns". *ICLR 2026 Conference Submission.*

Patents

- 12 first-inventor patents on fingerprint segmentation, restoration, retrieval, orientation estimation, and liveness detection for large-scale biometric recognition systems.