Jiawei Liu, Ph.D.

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WORK EXPERIENCE

Shenyang Institute of Automation, Chinese Academy of Sciences Aug. 2024 – Present
Research Assistant Professor

EDUCATION

University of Chinese Academy of Sciences, Shenyang, China Sept. 2018 - Jul. 2024
Ph.D. in Pattern Recognition and Intelligent System (Advisor: Prof. Yandong Tang) GPA:3.81/4.00
Thesis Title: Image Illumination Processing and Restoration Based on Deep Learning

University of Science and Technology of China, Hefei, China Sept. 2018 - Jul. 2019
Basic Courses

Northeast Agricultural University, Harbin, China Sept. 2014 - Jul. 2018
B.S. in Engineering GPA:3.79/4.00
Thesis Title: Leucorrhea Microcell Detection System Based on PC Platform for Assisting Disease Diagnosis

RESEARCH INTERESTS

Computer Vision, Image Restoration, Diffusion Models, Shadow Removal, Industrial AI

RESEARCH OUTPUTS

PUBLICATIONS (* Co-first authors, † Corresponding or Co-corresponding authors.)

[1] **Jiawei Liu**, Qiang Wang, Huijie Fan, Yinong Wang, Yandong Tang, Liangqiong Qu. Residual Denoising Diffusion Models[C]//Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2024: 2773-2783. (CVPR 2024 | **CCF-A**)

[2] **Jiawei Liu***, Qiang Wang*, Huijie Fan, Wentao Li, Liangqiong Qu, Yandong Tang. A Decoupled Multi-Task Network for Shadow Removal[J]. IEEE Transactions on Multimedia, 2023, 25: 9449-9463. (TMM 2023 | **CCF-A**)

[3] **Jiawei Liu**, Qiang Wang, Huijie Fan, Jiandong Tian, Yandong Tang. A Shadow Imaging Bilinear Model and Three-Branch Residual Network for Shadow Removal[J]. IEEE Transactions on Neural Networks and Learning Systems, 2024, 35(11): 2274-2285. (TNNLS 2024 | CAA-A)

[4] Ziyue Lin*, Jiahe Hou*, Hongyu Xia*, Xinrui Xie, Feifei Wang, Yuyin Zhou, Wei Wang, **Jiawei Liu**†, Liangqiong Qu†. Decoupled Residual Denoising Diffusion Models for Unified and Data-Efficient Image-to-Image Translation[C]//Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2026. (CVPR 2026 | **CCF-A**)

[5] Xing Xie*, **Jiawei Liu***, Ziyue Lin, Huijie Fan, Zhi Han, Yandong Tang, Liangqiong Qu. Unleashing the Potential of Large Language Models for Text-to-Image Generation through Autoregressive Representation Alignment[C]//Proceedings of the AAAI Conference on Artificial Intelligence. 2026. (AAAI 2026 **Oral** | **CCF-A**)

[6] Haotian Peng*, **Jiawei Liu***, Jinsong Du, Jie Gao, Wei Wang. BearLLM: A Prior Knowledge-Enhanced Bearing Health Management Framework with Unified Vibration Signal Representation[C]//Proceedings of the AAAI Conference on Artificial Intelligence. 2025. (AAAI 2025 | **CCF-A**)

[7] Siyuan Wang*, **Jiawei Liu***, Wei Wang, Yeying Jinying, Jinsong Du, Zhi Han. MMGT: Motion Mask Guided Two-Stage Network for Co-Speech Gesture Video Generation[J]. IEEE Transactions on Circuits and Systems for Video Technology, 2026, 36(2): 1446-1459. (TCSVT 2026)

[8] Xing Xie, **Jiawei Liu**, Huijie Fan, Zhi Han, Yandong Tang, Liangqiong Qu. DVG-Diffusion: Dual-View Guided Diffusion Model for CT Reconstruction from X-Rays[J]. IEEE Transactions on Image Processing, 2026, 35: 1158-1173. (TIP 2026 | **CCF-A**)

[9] Yang Lu, Jiandong Tian, Yiming Su, **Jiawei Liu**, Chunhui Hao, Chenghai Yue, Xin Yang. Polarization-Aware Low-Light Image Enhancement for Nighttime Intelligent Vehicles[J]. IEEE Transactions on Intelligent Vehicles, 2024, 10(3): 1944-1958. (TIV 2024)

[10] Haotian Peng, Jie Gao, **Jiawei Liu**, Jinsong Du, Wei Wang. A Unified Rotating Machinery Health Management Framework Leveraging Large Language Models for Diverse Components, Conditions, and Tasks[J]. Engineering Applications of Artificial Intelligence, 2025, 162: 112544. (EAAI)

[11] **Jiawei Liu**, Huijie Fan, Qiang Wang, Wentao Li, Yandong Tang, Danbo Wang, Mingyi Zhou, Li Chen. Local Label Point Correction for Edge Detection of Overlapping Cervical Cells[J]. Frontiers in Neuroinformatics, 2022, 16: 895290. (Q2)

[12] Hao Cui, Xingqiang Li, Rigang Cong, Jinsong Du, **Jiawei Liu**. An Oblique-Incidence Statistical Model for Laser Speckle[J]. Optics Communications, 2024, 571: 130896. (Q2)

[13] **Jiawei Liu**, Huijie Fan, Yiming Su, Zhen Yan, Qiang Wang, Wentao Li, Yandong Tang. A Continuous Illumination Estimator for Shadow Removal[C]//2023 IEEE 13th International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (CYBER). 2023: 1207-1211. (EI)

[14] Xiaobao Wei, Qinghua Wang, Zhenhua Li, Jiancheng Lai, **Jiawei Liu**. ResDif-IGEV: Residual Diffusion for Iterative Geometry Encoding Volume in Stereo Matching[C]//2025 China Automation Congress (CAC). 2025. (EI)

[15] Yiming Su, Yang Lu, **Jiawei Liu**, Zhen Zhang, Jiandong Tian. Polarization Image Demosaicking With Directional Cubic Residual Interpolation[C]//2023 IEEE 13th International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (CYBER). 2023: 657-661. (EI)

[16] Longzhe Quan, Chenglin Li, Zhengyang Feng, **Jiawei Liu**. Algorithm of Works' Decision for Three Arms Robot in Greenhouse Based on Control with Motion Sensing Technology[J]. Transactions of the Chinese Society for Agricultural Machinery, 2017, 48(3):14-23. (In Chinese)

Software Copyrights

[1] **Jiawei Liu**. MulimgViewer Multi-Image Viewer Software. Software Copyright Registration No. 2021SR1300937.

Patents

[1] Jinsong Du, **Jiawei Liu**, Siyuan Wang, Wei Wang, Jiahe Hou. A Two-Stage Network for Co-Speech Gesture Video Generation Guided by Motion Masks. China Patent No. 202510388864.3. Filed on 2025-03-31.

PROJECTS

- **Liaoning Provincial Natural Science Foundation – Provincial Doctoral Research Startup Project**: Research on Visual Inspection System and Recognition Algorithms for Aerospace Engine Assembly Process (In progress | **Project Leader**)
- **Shandong Laboratory of Aluminum Advanced Manufacturing in Binzhou Open Project - General Program**: Research on Key Image Restoration Technologies in Complex Scenes of Aluminum Electrolysis Plant Areas (In progress | 2026.5.1–2028.4.30 | **Project Leader**)
- **China Postdoctoral Science Foundation – 78th General Program**: Research on Key Technologies of All-Weather Image Restoration for Outdoor Autonomous Robots (2025M781669 | In progress | 2025.12–2027.12 | **Project Leader**)
- **Youth Project of Basic Research Program, Shenyang Institute of Automation, Chinese Academy of Sciences**: Research on Visual Inspection Methods for Aerospace Engine Assembly Process (2025JC1K05 | In progress | 2025.11–2028.10 | **Project Leader**)
- **Open Source Project**: MulimgViewer (2020.08–present | **Project Leader**). This project has been used by researchers from many universities (e.g., USTC, Tsinghua University, Peking University, UC Berkeley, Imperial College London) and companies (ByteDance, Tencent, Megvii, etc.). It provides a multi-dimensional data (water surface, underwater images, GPS, temperature, pressure) parallel visualization solution for the European Geoswim geological project, and a unified multi-visual algorithm display framework for the joint research project between the Vision Group and Underwater Research Lab of the Shenyang Institute of Automation, CAS. Project overview: 1.4k stars, 12k downloads, 300 community members, 12 contributors, cross-platform support. Project URL: https://github.com/nachifur/MulimgViewer.
- **National Natural Science Foundation of China – Major Program Subproject**: Research on Real-Time Interactive Cognitive Mechanisms for Multi-Vessel Systems in Complex Sea Conditions (61991413 | Completed | 2020.1–2024.12 | Core Member) – Responsible for unified visual perception modeling and algorithm development in complex sea environments: (1) Proposed a bilinear shadow imaging model and a three-branch residual network, extending single-task learning to multi-task learning and improving performance (IEEE TNNLS); (2) Proposed a unified and interpretable residual diffusion model, unifying image generation, restoration, inpainting, and translation tasks with varying levels of stochasticity and determinism (CVPR 2024).
- **National Natural Science Foundation of China (General Program)**: Research on Target Detection and Tracking Algorithms in Oceanic Photic Layer (61873259 | In progress | 2023.1–2026.12 | Core Member) – Responsible for robust underwater scene detection algorithms, transferring residual learning and multi-task decoupling shadow removal framework to underwater object detection and tracking (IEEE TMM).
- **National Natural Science Foundation of China (General Program)**: Weakly Supervised Lesion Diagnosis Algorithms for Medical Images Based on Online Learning (62273339 | Completed | 2019.1–2022.12 | Core Member) – Responsible for building a large-scale high-precision cervical cell dataset, proposing a locally linear high-accuracy annotation correction algorithm, successfully applied to overlapping cervical cell boundary detection and segmentation dataset construction (Frontiers in Neuroinformatics).
- **Industry Collaboration Project**: Full-field Strain Measurement for Large Deformation Based on Integer Genetic Algorithm (2018.09–2019.12 | Software Development Lead)
- **Industry Collaboration Project**: System Architecture Modeling for Logistics Management Major in University–Enterprise Cooperation (2018.09–2019.12 | Algorithm Development Lead)
- **Undergraduate Thesis Project**: Independently developed algorithms and software for a white blood cell microscopic detection system for assisted disease diagnosis (2017.09–2018.07)

- **Pre-research Project**: Fruit and Vegetable Grading and Packaging System Based on Delta Mechanism (2015.07–2015.10 | Kinematics Analysis and Debugging)
- **Innovation & Entrepreneurship Project**: Three-Arm Intelligent Harvesting Robot Based on Motion Capture Control (2015.01–2015.06 | Software Development Lead)

HONORS & AWARDS

- **2025.08** Second Prize, 2nd Liaoning Postdoctoral Innovation and Entrepreneurship Competition
- **2025.04** Innovation Award, Liaoning Youth AI Innovation Competition
- **2024.10** Outstanding PhD Graduate, Shenyang Institute of Automation, Chinese Academy of Sciences
- **2023.07** Best Poster Award, IEEE-CYBER 2023
- **2023.05** Outstanding Youth League Cadre (University-level), Shenyang Institute of Automation, Chinese Academy of Sciences
- **2022.09** Second-Class Academic Scholarship, Shenyang Institute of Automation, Chinese Academy of Sciences
- **2022.05** Merit Student (University-level), University of Chinese Academy of Sciences
- **2021.10** Third Prize, 4th China Software Open Source Innovation Competition (Open Source Project Innovation Track, Free Group)
- **2017.12** National Encouragement Scholarship
- **2016.12** Second Prize, Higher Education Press National Undergraduate Mathematical Contest in Modeling
- **2015.12** Grand Prize, 1st "Dongfanghong Cup" National College Students Intelligent Agricultural Equipment Innovation Competition
- **2015.09** First Prize, 11th "Borch Cup" Heilongjiang Provincial Undergraduate Embedded System Competition

ACADEMIC & COMMUNITY SERVICES

- **Reviewer** for IEEE TPAMI, IEEE TIP, IEEE TNNLS, IEEE TMM, IEEE TCSVT, IEEE TII, Information Fusion, Neurocomputing, Signal Processing Letters, CVPR 2026, ICML 2026, ICLR 2026, AAAI 2026, ACM MM 2026, ECCV 2026, NeurIPS 2025, ICCV 2025, WACV 2026, ECCV 2022, ICIRA 2022, and Image and Vision Computing.
- **2025.11–Present**: Young Editorial Board Member, Intelligence & Robotics.
- **2025.10–Present**: Member, Visualization and Cognitive Computing Committee, China Graphics Society.
- **2025.06–Present**: Member, Shenyang Chapter, CCF YOCSEF.
- **2021.09–Present**: Huawei Cloud Expert, Huawei Cloud.
- **2022.09–2024.06**: President, Open Source Software Association, University of Chinese Academy of Sciences.
- **2021.09–2024.04**: Secretary, First Graduate Student Party Branch, Shenyang Institute of Automation, Chinese Academy of Sciences.
- **2019.09–2020.06**: Class Monitor, First Research Division, Shenyang Institute of Automation, Chinese Academy of Sciences.
- **2015.09–2016.09**: Key Member, Robotics and Mechatronics Research Center, Northeast Agricultural University.

TALKS

- **2026.02.05**, **Shenyang, China**, Research on visual inspection technology for the aerospace engine assembly process (Technical Seminar of the Intelligent Inspection and Equipment Laboratory, Shenyang Institute of Automation, Chinese Academy of Sciences)
- **2026.01.09**, **Shenyang, China**, Exploring a unified image-to-image distribution transformation framework — Residual Denoising Diffusion Models (Inaugural Young Scholars Forum of the journal Intelligence & Robotics)
- **2024.07.21**, **Dalian, China**, Residual Denoising Diffusion Models (7th "Forge Ahead" Young Scientists Forum of the Chinese Society of Graphic Sciences 2024 — Annual Report of Top Journal/Conference Papers)
- **2024.07.18**, **Qingdao, China**, Residual Denoising Diffusion Models (Academic Exchange, Institute of Oceanology, Chinese Academy of Sciences)
- **2024.06.06**, **Shenyang, China**, Residual Denoising Diffusion Models (CEC Information — "Commander Academy" Live Broadcast)
- **2023.08.24**, **Dalian, China**, Research on shadow imaging models and removal algorithms (CSIG 1st Regional Salon — "Northeast Region Image and Graphics Field" Industry–University–Research Exchange Meeting)
- **2023.07.09**, **Shenyang, China**, MulimgViewer Multi-Image Browser (OpenCAS July 2023 Sharing Session, Open Source Association, University of Chinese Academy of Sciences)
- **2019.09–2020.06**, **First Research Department, Shenyang Institute of Automation, Chinese Academy of Sciences**, Class Monitor