

# Qihang Jin

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## EDUCATION

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University of Science and Technology of China (USTC), Institute of Advanced Technology Hefei, China

*Master of Engineering in Electronic and Information Engineering* | GPA: 3.8/4.3 Aug. 2024 – Jun. 2027

**Relevant Courses:** Computational Number Theory, Advanced Artificial Intelligence, Computer Vision, Advanced Computer Networks, Deep Learning by Doing, TinyML

**Honor:** First-Class Graduate Scholarship, USTC Graduate School (2025)

Chang'an University, School of Automobile Xi'an, China

*Bachelor of Engineering* Aug. 2018 – Jul. 2022

## PUBLICATION

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Enze Ge, **Qihang Jin**, Yuhang Xie, et al. From Memory to Alignment: A Comprehensive Review of Large Language Model Optimization. *TechRxiv*. October 21, 2025.

DOI: [10.36227/techrxiv.176107630.07942950/v1](https://doi.org/10.36227/techrxiv.176107630.07942950/v1)

Effect of Brain-Computer Interface on Limb Motor Function after Intracerebral Hemorrhage in Basal Ganglia and Its Rehabilitation Mechanism. Under review, Jun 2025

**Qihang Jin** and Enze Ge and Yuhang Xie , et al. Multimodal Representation Learning and Fusion. arXiv, Jun 2025

DOI: [10.48550/arXiv.2506.20494](https://doi.org/10.48550/arXiv.2506.20494)

## RESEARCH EXPERIENCE

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HySSM-Pyramid Learnable Hypergraph Scans for Multi-Scale Vision Since Jul. 2025

- Developed HySSM-Pyramid visual backbone; proposed a learnable hypergraph scanning mechanism, constructed differentiable hyperedges on pyramid features and integrates learnable anchors with gated scanning/aggregation. Combined SSM-based linear spatiotemporal accumulation with hypergraph message passing to capture long-range dependencies and multi-scale context, maintaining  $O(N)$  scanning efficiency and numerical stability constraints.
- Implemented core modules and a robust training pipeline (LAMB + per-step cosine warmup/cooldown, EMA, AMP, mutually exclusive MixUp/CutMix); debugged NaN issues from scheduling and overflow; completed distributed acceleration, FLOPs/throughput profiling, and YAML/script automation; achieved competitive accuracy and reproducibility on ImageNet-1K with low computational cost.

Jacobi Orthogonal Rotation Adapter via Sparse Givens Rotations and Tiny Core Since Jul. 2025

- Proposed and implemented the **J-ORA adapter**, constructing  $\Delta W = Q_L D Q_R^T$  using bilateral sparse Givens rotations and a Tiny Core (diagonal/block/micro low-rank structure). Introduced curvature-normalized greedy pair selection, small-angle closed-form initialization, and Cayley-stable updates, coupled with spectral norm regularization and S-budget warm-up.
- Engineered fused Triton kernels and bake inference; fully integrated with **LLaMA-Factory (CLI/WebUI, unified hyperparameters)**; completed end-to-end training and system ablation.

Automotive Performance Data Processing and Analysis Software Jun. 2022

- Developed a **MATLAB/GUI application** for automotive performance experiment data analysis, featuring multi-interface switching, numerical analysis, and curve fitting.
- Calculated key performance indicators (dynamics, fuel economy, braking, stability) and generated comprehensive

reports with data, charts, and conclusions to support engineering decisions.

- Implemented multiple data analysis algorithms with accuracy and efficiency; conducted testing to ensure reliability.
- Built a user-friendly GUI for data entry, analysis selection, and result visualization to improve efficiency by 10%.

## PROJECT EXPERIENCE

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### Integrated UAV Inspection Training Platform | Development Engineer

Since Sept. 2024

- Developed a high-fidelity UAV inspection simulation platform using UE4.27 and AirSim, integrated with an e-sports cockpit for enhanced immersion and interactivity.
- Independently designed a user-friendly interface to ensure smooth operation and intuitive control.
- Developed backend algorithm, optimizing UAV localization, autonomous flight, and collision detection; reduced response latency by 10%. Optimized code performance, improving system efficiency by 5%.

### License Plate Recognition System Based on Convolutional Neural Network | Project Leader

2020

- Designed and implemented a CNN-based license plate recognition system, achieving 95% recognition accuracy across diverse image datasets.
- Developed a comprehensive image preprocessing pipeline with OpenCV, including camera calibration, color segmentation, contour detection, grayscale conversion, Sobel edge detection, binarization, character segmentation, Gaussian blurring, and flood filling to enhance OCR accuracy.
- Trained and fine-tuned CNNs on large datasets, ensuring robustness to lighting and view variations.
- Applied data augmentation, dropout, and batch normalization to enhance generalization and prevent overfitting; optimized hyperparameters for balanced performance and training efficiency.

### “Internet+” Competition: Main Track Bronze Award | Project Leader

2020

- Led OpenCV-based image preprocessing for license plate detection, constructing a pipeline with camera calibration, color segmentation, and contour detection for precise localization.
- Applied grayscale conversion, Sobel edge detection, binarization, character segmentation, Gaussian blurring, and flood filling to improve OCR recognition accuracy.
- Tuned parameters and algorithm combinations to enhance robustness under complex illumination and viewing conditions, significantly reducing noise, and improving segmentation accuracy.
- Organized and co-authored the competition paper detailing algorithm design and performance analysis; the project achieved excellent results and received a Bronze Award.

## PATENT

**Jin Qihang**, Cheng Zhaozhan. 2021. Adjustable limiting and fixing device for automated machining. CN 110480545 B, filed 08/23/2019, issued 07/09/2021.

## SKILLS

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- Languages: Chinese (Native), English (Fluent, IELTS 6.5, CET: 529)
  - Technical: Python, C, C++, Microsoft Office (Word, Excel, PowerPoint)
  - Machine Learning Tools: PyTorch, Scikit-learn, Pandas, NumPy