Jiale Chen

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Skills

Languages: Mandarin (Native), English (Advanced), German (Good)

Programming Languages: Python, MATLAB, C++, Kotlin, Java, GLSL
Technical Domains: ML, NLP, GNNs, XR, CAD, IIoT, Digital Twins, Computer Vision
Frameworks & Tools: Unity, Django, PyTorch, Docker, OpenCV, NumPy, ROS
Software Engineering: Git, Poetry, Anaconda, CI/CD (GitLab CI), pytest, mypy, pre-commit

Document Preparation: Microsoft Office Suite, LaTeX, Markdown

Education

Doctor of Philosophy | ***Bioengineering, Bioinformatics and Health Technologies*** — Oct. 2025 – present
Università di Pavia — Pavia, Italy

Master of Science | ***information and Communication Engineering*** — Nov. 2021 – Nov 2024
Technische Universität Darmstadt — Darmstadt, Germany

Bachelor of Eng. | ***Major: Electrical Engineering and its Automation, Minor: German*** — Sep. 2016 – Jun. 2020
China University of Mining and Technology — Jiangsu, China

Exchange Program | ***Major: Electrical and Electronic Engineering*** — Nov. 2018 – Mar. 2019
University of Nottingham — Nottingham, UK

Work Experience

Clinical Bioengineer — October 2025 – present
Fondazione CNAO / Clinical Bioengineering — Pavia, Italy

- Develop VR training system, targeted for patients empowerment in Upright particle therapy.

Feature Developer — May 2025 – Sept. 2025
TU Darmstadt / ETA Fabrik — Darmstadt, Germany

- Developed and maintained communication-protocol modules for the ETA-Nexus industrial automation platform.
- Designed and tested Python-based backend components, improving reliability and extensibility of the connection manager.

Connected Infotainment Internship — Oct. 2024 – Mar. 2025
AUDI AG — Ingolstadt, Germany

- Refined and expanded technical requirement documentation for the Series-Development Phase of Managed Device Management (MDM).
- Consolidated and documented requirements for the PoC of the Connected Streaming App.
- Conceptualized an automated testing solution for production apps, structured detailed technical specifications.
- Enhanced internal Media Tester App, focusing on automation, error detection, and UI improvements.
- Designed automated test reporting and created test scenarios using FFmpeg to simulate and validated unsupported, destroyed, and various error media files conditions.
- Optimized media playback logic for multi-screen environments and global audio control.

Student Research Assistant — May 2024 – Jul. 2024
TU Darmstadt / SPG Group — Darmstadt, Germany

- Provided tutoring for Signal Processing Lab, assisting students with lab exercises and concepts, evaluated submitted reports for grading.

Student Research Assistant Jun. 2023 – Jul. 2024
TU Darmstadt / NTS Group Darmstadt, Germany
- Validated anomaly detection methods in communication systems based on Graph theory.
- Developed anomaly detection and sequence-targeted prediction model based on Transformer model.

Infotainment Product Engineer Oct. 2020 – Aug. 2021
Stellantis (PSA) Group Shanghai, China
- Led the development and integration of the In-Vehicle Infotainment (IVI) Module, managing cross-functional collaboration between hardware and software suppliers to ensure seamless system integration.
- Coordinated closely with the testing team to oversee module validation and quality assurance on both test benches and vehicle prototypes.
- Managed module configuration and deployment across multiple carline projects, ensuring compliance with project timelines and technical requirements.

PROJECTS AND RESEARCH

Praktikum Visual Computing | ***Python, Pytorch*** 2025
Fraunhofer IGD / TU Darmstadt
- **Title: Mixture-of-Experts Neural Cellular Automata (NCA) for Abdominal CT Segmentation.**
- Designed and implemented multiple NCA-based segmentation backbones (full backbone, shared-convolution, shared-conv + dense) for 512×512 abdominal CT data.
- Developed and compared a variety of gating strategies (learning-based, averaging-based; level-wise vs. step-wise) to control expert selection and aggregation.
- Investigated different MoE placements (all-level vs. top-level) to balance segmentation accuracy and computational efficiency.
- Developed reproducible PyTorch pipelines and evaluation metrics for CT-1k, enabling systematic benchmarking; two architectures achieved superior performance over the baseline.

Master Thesis | ***Python, Pytorch*** 2024
Technische Universität Darmstadt
- **Title: Model-Assisted DL for Resource Allocation in Cellular Networks with Stochastic Channel Models.**
- Developed an unrolled GCN-DL framework combining traditional model-based optimization (WMMSE) problem to solve resource allocation in MU-MIMO systems.
- Focused on solving the non-convex mathematical problem, optimizing the weighted sum rate through iterative optimization and structured neural networks (Stochastic WMMSE).
- Applied stochastic channel models to simulate dynamic wireless environments and evaluated model performance on varying channel sequences.

Project Seminar | ***Python, Pytorch, Matlab*** 2023
Technische Universität Darmstadt
- Reproduction: Vision-Assisted 3-D Predictive Beamforming for Green UAV-to-Vehicle Communications.
- Led a team to reproduce and validate the mathematical models and algorithms from the original research paper, ensuring alignment with theoretical and experimental results.

Project Seminar | ***Python, Django*** 2022
Technische Universität Darmstadt
- **Title: Implementation of a 5G Data Tracing APP.**
- Independently developed a web-based application for 5G network data tracing, including data collection, processing, and visualization.

Bachelor Thesis | ***Python, ROS*** 2020
China University of Mining and Technology
- **Title: Robotic Navigation Study based on ROS and Machine Learning.**
- Conducted an in-depth theoretical study on robotic navigation systems, focusing on various sensors, including LiDAR and cameras, for environment perception and mapping.
- Simulated end-to-end deep learning model for robot mapping using camera inputs.
- Implemented a practical SLAM-based mapping and navigation system on a ROS mobile robot, successfully navigating a dormitory corridor.