

XIANG ZHANG

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🎓 EDUCATION

University of Electronic Science and Technology of China 2022 – Present

Master of Engineering in Control Science and Engineering, expected July 2025

University of Electronic Science and Technology of China 2018 – 2022

Bachelor of Engineering in Measurement and Control Technology and Instrument

📄 PUBLICATION

Sparse-view CT Reconstruction via Attention-based Parallel Dual-domain Fusion Aug. 2024

Fupei Guo, Xiang Zhang, Bo Yang, Wenfeng Zheng, Lirong Yin and Chao Liu SUBMITTED

The study presents a dual-domain reconstruction network for Sparse-View Computed Tomography (SVCT) that uses parallel branches for sinogram and image domains, enhanced by a global attention module. This approach minimizes error propagation and utilizes the complementary strengths of both branches. A lightweight CNN and Transformer module in the sinogram branch recovers missing projection views. The network demonstrates high performance in SVCT reconstruction, effectively reducing noise while preserving details, and is validated on a Mayo Clinic benchmark dataset.

👥 EXPERIENCE

Motion Compensation Using Deep Reinforcement Learning Jan. 2024 – Present

C#, Pytorch, Unity ML Agents, RL, Sim2Real

This project aims to achieve motion compensation for surgical robots by developing an end-to-end visual model for controlling the robot's end-effector torque. A virtualized robot model is implemented in Unity to facilitate reinforcement learning for model training, which is subsequently transferred to the real robot using Sim2Real transfer techniques.

- Digital twin of surgical machinery built in Unity ML Agent based on system identification;
- Training the model in a virtual environment by SAC-LSTM / PPO-LSTM;
- Sim2Real deployment;

[Tencent Internship] RF Signal Generation and Acquisition System Mar. 2024 – Jun. 2024

C, Python, Signal processing, RFSoc

This project aims to implement an ultra-high speed signal generation and acquisition system using Xilinx RF-SoC.

- Development of RFSoc device driver;
- Development of test bed and experimental platform for RFSoc device.
- Development of assembly-like code to support implementation of nanosecond-level delay control;

[Teaching Assistant] Introduction to Deep Learning Sept. 2022 – Jun. 2023

Grading student work, answering questions, supervising experiments

Surgical Navigation and Teleoperation for Robot-Assisted Spine Surgery Nov. 2022 – Nov. 2023

C++, Python, ROS, OpenCV, NumPy, manipulator

The project aims to design a surgical navigation and teleoperation system for robot-assisted spine surgery, realizing a high-precision positioning system; path planning and navigation of puncture; automated execution of puncture; teleoperation robot arm control.

- Development of high-precision algorithm based on Python and NumPy to achieve sub-millimeter accuracy;

- Development of teleoperation control system based on real-time feedback to achieve low-latency teleoperation control;
- Development of the visualization of the system based on QT and VTK

Force Feedback Immersive Remote Ultrasound Diagnosis Technology Nov. 2021 – Nov. 2023

C++, Python, VR, OpenCV, Eigen, manipulator

The project aims to develop an image registration algorithm to align ultrasound images with stereo images and display them in VR glasses, utilizing a 6-axis force sensor and force feedback handle to achieve remote ultrasound diagnosis with force feedback in virtual reality.

- Development of ultrasound image and stereo image registration algorithm based on C++, OpenCV and Eigen to realize efficient real-time registration algorithm;
- Socket-based image transmission and signal transmission to realize low-latency, high-quality image and signal transmission;
- Force feedback modeling, data denoising, force feedback handle control to realize more realistic force feedback teleoperation control;

[Contest] Implement Robotic Palletizer with AGV

Nov. 2020 – Sept. 2021

C++, OpenCV, navigation system, AGV, palletizer

The aim of the project is to design a robotic palletizer with AGV to perform the tasks in a simplified factory environment. The robot finally participated in China University Engineering Practice and Innovation Ability Competition and won the second prize.

- Development of navigation system based on gyros, odometers and guide lines of the environment;
- Development of high precision vision algorithm based on C++ and OpenCV;
- Development of robot chassis control program;

[Contest] Automatic Rugby Robots

Oct. 2019 – Oct. 2020

C/C++, OpenCV, ROS, map building, LiDAR

The aim of the project is to design two rugby robots to perform the tasks of kicking, passing and receiving, and touchdown. The two robots finally participated in China University Robot Competition and won the second prize.

- Development of robot's system based on ROS, and realize map building and full field localization by LiDAR;
- Development of high precision vision algorithm based on C++ and OpenCV;
- Development of robot chassis control program;

SKILLS

- Programming Languages: C/C++, Python, \LaTeX
- Platform: Linux, FreeRTOS
- Development: PyTorch, NumPy, PyQt, ROS, OpenCV, Docker, CMake, Git

HONORS AND AWARDS

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| • 2 nd Prize, China University Robot Competition | Oct. 2020 |
| • 2 nd Prize, China University Engineering Practice and Innovation Ability Competition | Sept. 2021 |
| • 2 nd Prize, China Postgraduate Mathematical Contest in Modeling | Oct. 2022 |

MISCELLANEOUS

- GitHub: <https://github.com/innns>
- Languages: English - TOEFL 96; Mandarin - native speaker
- GRE: Q 170 + V 148
- Hobbies: Photograph, Dark room and film processing