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* Working Paper

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

[Research Project] Visual Servoing Motion Compensation Jan. 2024 – Present

This project aims to achieve a visual servoing motion compensation for surgical robots by controlling the robot's end-effector's current. A virtualized robot model is implemented in Unity to facilitate controller training, which is subsequently deployed in the real-world robot.

- System identification for the robot;
- Training the motion compensation controller in a virtual environment;
- Deploying the controller in the real-world robot;

[Research Project] Surgical Navigation and Teleoperation for Robot-Assisted Spine Surgery Nov. 2022 – Nov. 2023

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

[Research Project] Force Feedback Immersive Remote Ultrasound Diagnosis Technology Nov. 2021 – Nov. 2023

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

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;

Intersts and Skills

- Computer Skills: C/C++, Python, LaTeX
- Languages: English - TOEFL 96; Mandarin - native speaker
- GRE: Q 170 + V 148
- Hobbies: Photograph, Dark room and film processing

♡ Honors and Awards

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