Zantian Zhao

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Education

Nanjing University, Jiangsu, China *Sept. 2020 - Jun. 2024*

Degree: Bachelor of Communication Engineering

- *Major: Communication Engineering*
- *GPA: 4.503/5.0 (90.06/100)* [*Class ranked: 4 / 58*]

Relevant Courses: Mobile Communications, Signals and Systems, Digital Systems I, Electromagnetic Field Theory and Microwave Technology, Methods of Mathematical Physics, Data Structure and algorithms, College Physics, Calculus, Linear Algebra, Probability and Stochastic Process.

Research & Project Experiences

Conducted research on AGV Stability, Safety, and MAC System Scalability in Large-scale Deployments with Autonomous Driving Prospects *Sept. 2023 - Dec. 2023*

Mentor: Prof. Liu Wei, Hong Kong Polytechnic University, Hong Kong (Remote)
Research Assistant

- Conducted research on electric vehicles, focusing on addressing scalability and reliability issues in MAC systems for charging multiple Auto Guided Vehicles (AGVs) simultaneously or in large-scale AGV deployments.
- Utilized knowledge in communication principles, mobile communication, and data communication, along with previous project experience, to develop MATLAB code addressing the communication aspects.
- Collaborated with the AGV-MAC communication system and charging infrastructure to establish a robust communication protocol (e.g., Wi-Fi or RFID) for seamless coordination between AGVs and the MAC system.

Research on Medical Image Prediction using Deep Learning Models and Improvements in Uncalibrated MRI Image Reconstruction for a 0.05T Ultra-Low-Field Brain MRI Scanner *Sept. 2023 - Nov. 2023*

Mentor: Prof.Ed X. Wu, Hong Kong University, Hong Kong (Remote)
Research Assistant

- Conducted an in-depth study of some research papers, and pushed the limits of low-cost ultra-low-field MRI by dual-acquisition deep learning 3D superresolution.
- Reconstructed multi-channel MR data with deep learning estimated ESPIRiT maps and spatial nulling maps, then made a comparison between their reconstruction results.
- Debugged and tested relevant code, particularly in PyTorch, for utilizing and building U-Net neural networks.
- Explored and trained improved models such as UNet++, Unet3+, and made innovative improvements to the 2D-attention module.

Experimental and Innovative Research on the Classic Paper "Comparisons of Channel-Assignment Strategies in Cellular Mobile Telephone Systems" *Mar. 2023 - Jun. 2023*

Mentor: Prof.Wang in the Mobile Intelligent NeTworks Group (MINT), Nanjing University
Research Assistant

- Conducted a detailed reading and analysis of the paper, made comparisons of channel-assignment strategies in cellular mobile telephone systems, and developed corresponding MATLAB algorithms.
- Took the responsibility for comparing the two new channel assignment strategies, LODA and BDCL, with the Fixed Assignment (FA) strategy.
- Developed the corresponding code using MATLAB and compared the reproduced results with the ideal cases mentioned in the paper.

MRI-CT Human Skeleton Image Registration - for Adjuvant Treatment of Malignant Tumors *Sept. 2021- Dec. 2022*

Mentor: Prof.Yuan Jie, Nanjing University
Project Member, National Training Program of Innovation for Undergraduates

- Conducted extensive image and data preprocessing for human skeletal regions.
- Developed innovative algorithms using Python and MATLAB for point cloud imaging, specifically implementing the Iterative Closest Point (ICP) registration algorithm, resulting in enhanced accuracy of 3D point clouds and sequential images.
- Built the U-Net neural network framework for medical image segmentation and applied it to the project's image segmentation tasks. Evaluated the segmentation results using metrics such as Intersection over Union (IOU) and Dice similarity coefficients.
- Completed initial image segmentation and dataset processing, participated in mid-term and final project presentations, and received recognition as a recipient of the National Excellent Innovation and Entrepreneurship Project.

Research on Convolutional Neural Network(CNN) Learning for Visual Recognition *Sept. 2022 - Nov. 2022*

Mentor: Prof. Zhou Yu, Nanjing University
Research Assistant

- Engaged in studying and discussing the course materials of Stanford University's CS231n Deep Learning for Computer Vision in the lab.
- Took on the responsibility of processing datasets for research papers and acquired skills in constructing Convolutional Neural Networks (CNNs).

3D Human Pose Recognition Experiments *Apr. 2022 - Oct. 2022*
Mentor: Prof. Zhou Yu, Nanjing University
Research Assistant
- Conducted research on the use of convolutional neural networks (CNNs) and related learning techniques for joint recognition and labeling of human image nodes, specifically focusing on 3D human pose recognition.
- Explored learning 3D models from motion-based human models and generating 2D images from 3D models, addressing the challenges of scale variation in bottom-up multi-person pose estimation.
- Performed experiments on multi-resolution supervision (enabling the model to attend to multiple scales simultaneously) and multi-resolution heatmap aggregation (enhancing the model's scale-awareness).

Computer Vision: From 3D Reconstruction and Recognition to Camera Models, Imaging Principles, and Parameter Learning *Apr. 2022 - Sept. 2022*
Mentor: Prof. Zhou Yu, Nanjing University
Research Assistant
- Conducted an extensive literature review related to camera imaging principles and gained a deep understanding of the content and applications of matrix computations in computer vision and camera models.
- Took on the responsibility for developing a human body recognition program using Python, which included topics such as 3D shape reconstruction, as well as high-level visual tasks including object recognition, scene recognition, face detection, and human motion classification.

Honors & Certificates

- The People's Scholarship in 2021 & 2023 *Dec. 2021 & Dec. 2023*
- Outstanding Members of the Nanjing University Excellent Graduate Summer Camp *Jul. 2023*
- National Excellent Training Program of Innovation for Undergraduates *Mar. 2023*
- 01 Electronic Scholarship in 2022 (2%) *Dec. 2022*
- Outstanding Student of Nanjing University at the university level in 2022 (5%) *Dec. 2022*
- Outstanding Volunteers at Nanjing University in 2022 *Dec. 2022*
- Participated in the National Scholarship Defense in 2022 (5%) *Sept. 2022*
- Outstanding Communist Youth League Member during the May Fourth Movement *May. 2022*
- Outstanding Graduate Student *Jun. 2024*

Extracurricular Activities

Volunteer Activities During University *Sept. 2020 - Jun. 2023*
Volunteer
- Participated in activities such as Reading Companion Support Teaching at Shuangbai Elementary School in Yunnan, Love Bookstore, and Freshmen Welcome Party.
- Accumulated over 150 hours of voluntary work over three years and receiving the title of Outstanding Volunteer at the university level.

"Jinshan Jinshui" Social Practice Activity *Jun. 2021 - Dec. 2021*
Member
- Conducted field visits and research, visiting coal mines and power bureaus in my hometown, Taiyuan, Shanxi, to promote the use of clean energy and improve the local environment.
- Earned the title of Outstanding Social Practice Activity at the university level.

Student Union of School of Electronic Science and Engineering (SESE), Nanjing University *Sept. 2020 - Oct. 2021*
Media Department Member
- Contributed to the coordination of numerous campus events on a large scale and oversaw the creation and formatting of content for pertinent public accounts, resulting in the attainment of more than 100,000 clicks on the articles published on the public account.

Yuxiu College Student Union Culture and Sports Department, Nanjing University *Sept. 2020 - Oct. 2021*
Culture and Sports Department Member
- Held the Freshmen Welcome Party for Yuxiu College, handling the preparation of performance props and personnel arrangements, receiving students' praise.

Electronic Class 4 , Nanjing University *Sept. 2020 - Jun. 2024*
Monitor
- Organized class activities and meetings, and coordinated various learning and daily affairs of the class.

Skills & Interests

- **Programming Skills:** Python, C, C++, MATLAB, Verilog (for FPGA programming), LabVIEW.
- **Libraries:** PyTorch, OpenCV, Sklearn, TensorFlow, Pandas.
- **Other Tools:** LaTeX, Microsoft Office, Photoshop, Markdown.
- **Language Skills:** Chinese(Native), English(Excellent). **IELTS: 7.5**
- **Interests:** Basketball, Badminton, Ping-pang Ball, Music, Singing, Guitar, Football, Dancing.