Junjie Chen

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Research Interests

Particularly focused on leveraging machine learning techniques to enhance various information processing tasks,such as information processing, image processing, and speech processing.

Education

University of Science and Technology of China(USTC) Hefei,China
Bachelor of Science in Electrical and Electronic Engineering *Sep 2021-Jul 2025(expected)*

- **Academic:** *Overall GPA 2.9/4.3(79/100)*

Research Experience

- **SiPM detector data measurement and analysis**
  Advisor:Prof Qingguo Xie, USTC *Dec. 2023-Feb. 2024*
  - Assembled and welded circuit boards, installed experimental devices, debugged circuits, and tested oscilloscopes.
  - Conducted data acquisition by placing a radioactive source and analyzing the output data.
  - Evaluated the quality of the detector based on measurement results.
- **Design of QPSK Band Communication System Based on Software-Defined Radio Platform**
  Advisor:Prof Wuyang Zhou, USTC *May. 2024-Jun. 2024*
  - As the team leader, organized team members, assigned tasks, regularly reported progress, and integrated various tasks into the overall project.
  - Co-developed algorithms, including PCM encoding anddecoding, CRC addition and verification, QPSK modulation and demodulation, frame synchronization, and channel encoding/decoding.
  - Downloaded and tested the programmed code on a radio platform, performed hardware and software adjustments, and achieved improved signal transmission and reception results.
  - Prepared experimental reports and delivered project presentations.
- **Research on Voice Enhancement Methods Based on Asynchronous Acoustic Sensor Networks**
  Advisor:Prof Jie Zhang, USTC *Oct. 2024-Jun. 2025(expected)*
  - Objective: Developing a program to address asynchronous issues in voice enhancement.

- Approach:
  - Simulated a room environment by arbitrarily positioning two microphones and placing a sound source at an equal distance from both microphones. Introduced noise and conducted audio transmission and reception. Performed resampling on one microphone channel to simulate an asynchronous signal scenario.
  - Utilized the frequency domain properties of audio STFT (Short-Time Fourier Transform) to train and implement an LSTM network for synchronization, ensuring both microphone channels achieved the same sampling rate.
  - Trained FaSNet/McNet as a speech enhancement module to process and enhance the signals from both microphones.
  - Compared the quality of the ideal signal, asynchronous signal, and network-processed signal to evaluate the performance of the network.
- Innovation: The innovative aspect of my approach involves using deep learning combined with mathematical tools to replace traditional, complex, and inefficient mathematical calculations.

Teaching Assistance Experience

- **Digital Image Processing**
  Teacher:Prof Rong Zhang, USTC *Feb. 2025-Jun. 2025(expected)*

  - Assisted in grading assignments, answering student questions, explaining exercises, and guiding experiments.
  - Independently implemented a "handwriting recognition image processing task" using both traditional K-means and CNN methods, conducted comparative analysis, and delivered a final presentation with supporting slides.

Skills

- **Python:** to conduct simple simulation and Machine Learning
- **Other programming language :** C, C++, Matlab, Verilog