XINYU CAO

● cao2xinyu@outlook.com ● https://www.linkedin.com/in/xinyu-cao-704727231/ ● https://github.com/krisplusmagger

EDUCATION

B.S.E. Telecommunication Engineering   September 2020 - June 2024

Shandong University of Science and Technology   84.72/100 GPA

College of Electronic and Information Engineering

Relevant coursework: Principles of Communication, Information Theory and Coding, Digital Signal Processing, Signals and Systems, Computer Network, Computer Systems

TECHNICAL SKILLS

Embedded Systems: STM32, STC15, Direct Digital Synthesis, Proteus
Design and Modeling Tools: MATLAB, Numpy, Pandas, Tensorflow
Programming: Python, C, JAVA
Technical skills: Git, Unix
English: IELTS 6.5, CET-6 493, CET-4 532

EXPERIENCE

TI Cup National Undergraduate Electronics Design Contest, Jinan: Signal Separation Device   August 2023

- FFT frequency domain measurement, Software Phase-Locked Loop, Operational Amplifier Circuit Design
- Design and create a signal separation device as. A dual-output signal source generates two periodic signals, A and B (frequency range: 20kHz ~100kHz, with $f_a < f_b$ (peak-to-peak amplitudes are both 1V). These signals are combined using an adder with a gain of 1 to create a mixed signal, C. Signal C is then separated into signals A' and B' using a separation circuit. It is required that the waveforms of signals A' and B' exhibit no distortion when compared to signals A and B. Additionally, the waveforms of A' and A, as well as B' and B, should be continuously and stably displayed at the same frequency on an oscilloscope.

Lichuang Cup SDUST Electronic Design Competition, Qingdao: Basic oscilloscope and signal Generator April 2023

- ADC, DAC, Direct Memory Access, FFT, Waveform recognition
- Developed Developed a basic oscilloscope using STM32 microcontroller Implemented sampling, and quantization, and utilized Fast Fourier Transform (FFT) for waveform analysis. Expertise in signal processing and troubleshooting.

ACADEMIC PROJECTS

DTMF System Simulation and Implementation   May 2023 âĂŞ June 2023

Developed a new approach using ANN to demodulate DTMF signals.

- This course design was based on Python, TensorFlow, and STM32 and implemented a DTMF system.
- Using two STM32 boards to build real-time DTMF systems.
- A DNN network was designed using TensorFlow, and its excellent performance was demonstrated compared to other recognition methods, particularly in low signal-to-noise ratio conditions.

Modulation recognition using Conventional neural network   Spring 2023

Tensorflow, DNN, CNN, CLDNN

- Assessed signal samples datasets under low SNR to determine the possible types of modulation (Python, Numpy).
- There are three proposed architectures - DNN, CNN, CLDNN which are trained and evaluated on RadioML Datasets.
- Proving blind Convolutional Networks on time series radio signal data are viable and work quite well.

Digital Speech Signal Analysis and Recognition   December 2022 âĂŞ January 2023

MFCC, MRMR, K-Nearest Neighbor, MATLAB

- In this design, the FSDD dataset(pretty much similar to MNIST dataset but in audio form) and various audio processing techniques were employed to extract feature vectors from 0 to 9-digit speech signals. These techniques include speech framing with windowing, Mel filters, MFCC, Gammatone cepstral coefficients, KNN.