ZHUOWEN (CHARLES) LIN

Greater Atlanta Area | 404-358-6784 | zlin343@gatech.edu | https://www.linkedin.com/in/zhuowen-lin/

EDUCATION

08/2019-12/2020 **Georgia Institute of Technology | Atlanta, GA**

- **Master of Science** Major: Electrical and Computer Engineering (Digital Signal Processing)
- **Overall GPA: 3.75/4.00**

09/2015-07/2019 **Southern University of Science and Technology | Shenzhen, China**

- **Bachelor of Engineering** Major: Information Engineering (Digital Signal Processing)
- **Overall GPA: 3.78/4.00** **Ranking: 1/24**
- **Awards:** Outstanding Undergraduate Thesis Award, Outstanding Students Scholarship

WORK EXPERIENCE

07/2018-09/2018 ***Audio Algorithm Engineer (Intern)*, Shenzhen Micro & Nano Research Institute**

- Wrote MATLAB programs of acoustic echo cancellation (AEC) for smart speakers
- Implemented adaptive filtering algorithms like LMS, NLMS, AP and RLS
- Combined a deep neural network model used in speech enhancement with subband adaptive filtering to achieve better AEC effect

PROJECTS

06/2020-07/2020 **C++ software music synthesizer**

- Implemented main functions of a music synthesizer in software using C++
- Accomplished waveform oscillators, LFOs, filtering, ADSR envelope shaping, mixing and micro-tuning
- Built a GUI for the synthesizer with Qt framework

10/2019-12/2019 **Automatic Chord Recognition and Recommendation | Link**

- Created a Python real-time system with automatic recognition of multiple guitar chords and recommendation for chord progression
- Encoded data from guitar audio clips to chromagram features and chord labels
- Trained kNN, GNB, and SVM classifiers and compared their performances in chord recognition
- Built a chord recognition system with onset detection, chromagram extraction, and classifier classification
- Achieved over 93% accuracy in chord recognition

11/2019-12/2019 **Image Haze Removal using Dark Channel Prior | Link**

- Realized image dehazing with Dark Channel Prior (DCP) method in MATLAB
- Improved traditional DCP method by 0.15 in FSIMc value by introducing machine learning distance estimation to keep aerial perspective
- Verified the improvement effects with the RESIDE and CURE-TSD image dataset

05/2018-06/2018 **16-Step FPGA Music Sequencer and Synthesizer | Link**

- Created a hardware FPGA music synthesizer with 16 available pitches and 16 time sequence steps with VHDL that can be used in real-world music performance
- Designed and implemented the sequencer circuit using finite state machine, T flip-flops and D flip-flops
- Implemented functions of step progression, music notes selection and memorization, and a "play & pause" button
- Assisted to perform digital-to-analog conversion by applying a pulse width modulator

05/2017-06/2017 **Guitar Musical Instrument Digital Interface (MIDI) Controller | Link**

- Made an Arduino guitar MIDI controller
- Modified the existed guitar structure including fretboard and string pickup system

11/2016-01/2017 **Production of Guitar Distortion Effector Ibanez TS808 | Link**

- Produced a guitar effector that accomplished all functions in the classic TS808 effector including major distortion effect, volume and tone adjustment
- Simulated the prototype effector circuit and analyzed signals with Multisim
- Designed the PCB layout and soldered the effector circuit
- Carried out signal quality testing and circuit debugging

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TECHNICAL SKILLS

DSP

Digital signal processing, Beamforming, Array signal processing, Machine Learning

Audio & Music

Music information retrieval, Acoustic echo cancellation, Audio processing & engineering, Electroacoustic speaker design & analysis, Audio coding

Others

Digital image processing, Digital system testing, Basic knowledge about electric vehicle

Programming Languages

MATLAB, Python, C++, Java, VHDL, LabVIEW

SOFT SKILLS

Trilingual communication (English, Cantonese, Chinese)

- Speak Cantonese as my mother language with my cultural background in Hong Kong
- Speak English and Mandarin Chinese fluently as an intercultural communicator

Presentation

- Awarded "Outstanding Undergraduate Thesis Award", in which presentation took up 40% of the credits
- Presented my term paper "Wife, Mother, Daughter and Scientist: The Second Shift of Female Researchers" of the course "Intro to Sociology", as a public speaking in Southern University of Science and Technology
- Led presenting the projects "Automatic Chord Recognition and Recommendation", "Image Haze Removal using Dark Channel Prior" and "16-Step FPGA Music Sequencer and Synthesizer"

Article Writing

- Worked as a student journalist in responsible for writing news articles for Southern University of Science and Technology
- Led writing the course term papers "DDSP: Differentiable Digital Signal Processing for Machine Learning" and "Review of MPEG-1 – A Digital Audio Coding Standard"