HAN ZHANG

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EDUCATION

McCormick School of Engineering, Northwestern University　　　*Aug. 2019 - Jun. 2020*
- M.S. in Electrical Engineering; **Overall GPA: 3.97/4.0;**
- **Courses:** Discrete-time Signal Processing, Digital Filtering, Machine Learning, Random Processes, Human perception and Electronic Media, Human Computer Interaction.

Department of Automation, Tsinghua University, China　　　*Aug. 2015 - Jul. 2019*
- B.S. in Automation;
- Minor in Music Technology and Engineering.

RESEARCH EXPERIENCE

Project: Timbre Analysis and Synthesis　　　*May 2020 - Present*
Advisor: Thrasyvoulos (Thrasos) N. Pappas, Professor　　　*Team Leader*
- Obtained a set of features that are adequate for timbre description and sound synthesis by time-variant spectrum analysis. Developed an approach of sound synthesis based on the features. Determined principle controlling parameters by learning algorithms.
- Currently mapping the semantic descriptions and timbre spaces to the scales of these features, and finding characteristics of musical instruments. The features also provide with a new approach of generating timbral sound and music by shaping the time-variant spectrum based on additive model.

Project: Musical Audio Processing System　　　*Feb. 2018 - Jul. 2018*
Advisor: Jianming Hu, Associate Professor　　　*Research Assistant*
- Designed and implemented a system for musical audio processing, based on C++. The system allows audio processes, musical mixing operations, sound visualization and file operations. It is also designed to be scalable and available for plugins. Finished a user-friendly interface corresponded with users' conceptual model.

Project: Intelligent Tourism System　　　*Mar. 2018 - Jul. 2018*
Advisor: Yushun Fan, Professor　　　*Research Assistant*
- Designed and realized a route planning algorithm of the Intelligent Tourism System which came online in our campus. Solved the problem of selecting scenic spots and planning visit order user favorability, with the method of improved genetic algorithm. Compared the algorithm with other methods like ant colony optimization and found this algorithm more accurate and efficient.

Project: UAV Hardware-In-Loop Simulation System　　　*Oct. 2018 - Jul. 2019*
Advisor: Yisheng Zhong, Professor　　　*Research Assistant*
- Independently designed a frame of Unmanned Aerial Vehicle (UAV) Hardware-In-Loop (HIL) simulation system including embedded controller of the flights based on Raspberry Pi and Pixhawk, simulated the module in the Gazebo environment, and ground communication system(GCS) with interface designed in QT.
- Found solutions for real-time communication between UAVs and PC, as well as for implementation of several functions including formation flight, obstacles avoiding and failure avoiding.

SKILLS AND WORKS

Programming Languages	C, C++, Python, MATLAB, JavaScript, Java, Verilog HDL, SAS
Music Tools	Logic Pro, Cubase, Pro Tools, Sibelius
Composition Works	https://soundcloud.com/v2g3de6ogtfl/sets/demo-before-20
Standard English Test	**TOEFL:** 107 (R: 29; L: 29; S: 26; W: 23)
	GRE: V-152 (56%) + Q-170 (96%) + AW-3.5 (41%)
Second Foreign Language	**Japanese Language Proficiency Test N1** (Top Level)