

# HAN ZHANG

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## EDUCATION

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**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.

**Tsinghua University, China** *Aug. 2015 - Jul. 2019*

- B.S. in Automation;
- Minor in Music Technology and Engineering.

## RESEARCH EXPERIENCE

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**ECE Department, Northwestern University** *May 2020 - Present*

**Project: Timbre Analysis and Synthesis** *Team Leader*

**Advisor: Thrasyvoulos (Thrasos) N. Pappas, Professor**

- 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 mapped the semantic descriptions and timbre spaces to the scales of these features, and found 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.

**Department of Automation, Tsinghua University** *Feb. 2018 - Jul. 2018*

**Project: Musical Audio Processing System** *Research Assistant*

**Advisor: Jianming Hu, Associate Professor**

- 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.

**Institute of System Integration, Tsinghua University** *Mar. 2018 - Jul. 2018*

**Project: Intelligent Tourism System** *Research Assistant*

**Advisor: Yushun Fan, Professor**

- 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.

**Institute of Control Theory and Technology, Tsinghua University** *Oct. 2018 - Jul. 2019*

**Project: UAV Hardware-In-Loop Simulation System** *Research Assistant*

**Advisor: Yisheng Zhong, Professor**

- 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

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

## INTERNSHIP EXPERIENCE

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<b>SAS China</b> - Consultant	<i>Jul 2019 - Oct. 2019</i>
<b>Projects:</b> Circuit Defect Detecting	