

# Hao Ju

MASTER'S STUDENT, FULL STACK RESEARCH ENGINEER

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## Skillsets

<b>Programming</b>	MATLAB, C, Python, VHDL, JavaScript, C#, HTML, Java
<b>Tools</b>	Altium Designer, Quartus, Simulink, SPSS, Unity 3D, AutoCAD, Adobe Illustrator, Figma
<b>Embedded Systems</b>	Arduino, STM32, Raspberry Pi, MCS 8051, Xilinx Virtex
<b>Courses</b>	Data Structure & Algorithms, Analog & Digital Systems, Digital Signal Processing, Data Mining, Usability Analysis & Assessment, Human Computer Interaction
<b>Languages</b>	Mandarin (native), English (fluent, IELTS 8.0), French (basic)

## Education

### School of Information Studies, McGill University

Montreal, Canada

MIST IN INFORMATION STUDIES, RESEARCH TRACK

Sept 2019 - Exp. May 2021

- GPA: 3.73/4.0
- Area of specialization: Human Computer Interaction; Wearable Devices; Accessibility & User Experience

### School of Electronic Engineering, Univ of Electronic Sci & Tech of China (985,211)

Chengdu, P.R.China

B.ENG. IN ELECTRONIC AND COMPUTER ENGINEERING

Sept. 2014 - July 2018

- GPA: 3.86/4.0 (Final year 3.91/4.0), Ranking: 5/42 (Final year 3/42)
- Honorary Graduate of UESTC

## Selected Experience

### RESEARCH & DEVELOPMENT

#### Research Assistant

Montreal, Canada

DEPARTMENT OF INFORMATION STUDIES, MCGILL UNIVERSITY

Sept. 2019 - Present

- Supervisor: Prof. Karyn Moffatt
- Designing and developing a wearable limb-based input system for older adults, based on Raspberry Pi and Java. A study on the difference between interaction habits and performances among older adults and their younger peers is to be performed.

#### Research Assistant

Hong Kong, P.R.China

SCHOOL OF CREATIVE MEDIA, CITY UNIVERSITY OF HONG KONG

Sept. 2018 - May 2019

- Supervisor: Prof. Kening Zhu
- Provided technical support in Arduino programming and circuit design for other PhD students.
- Designed and developed hardware and firmware prototypes based on Arduino and C, e.g. musical building blocks introducing programming languages, thermal display systems for geographical education, etc.
- Co-designed and co-conducted user study experiments.

#### Research Intern

Montreal, Canada

SHARED REALITY LAB, MCGILL UNIVERSITY

July 2017 - Oct. 2017

- Supervisor: Prof. Jeremy Cooperstock
- Developed the hardware and firmware of a foot-based interactive system for seated musicians based on Arduino and C. Co-designed the menu layout in Unity using C#. Co-designed and conducted qualitative & quantitative usability study through interviews & NASA-TLX questionnaires. Published at ACM DIS'18 conference.
- Enhanced the performance of an existing prototype generating burning-hot illusion with Electro-Muscular Stimulation. Improved temperature detection accuracy by 37.5% by re-designing the system, switching from thermal variable resistors to digital sensors.

### PRODUCTION & QUALITY CONTROL

#### Production Management Intern

Shenzhen, P.R.China

SIGLENT TECHNOLOGIES

Aug. 2016

- Co-managed production and quality control process on the assembly line with full-time employees at the leading Chinese oscilloscope manufacturer.

### TEACHING

#### Teaching Assistant

Montreal, Canada

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, MCGILL UNIVERSITY

Sept. 2020 - Dec. 2020

- Teaching assistant of ECSE 222 Digital Logic. Job responsibility including demoing, tutoring, and grading.

### OUTREACH & LEADERSHIP

#### Core Member, Technical Volunteer

Chengdu, P.R.China

TECHNOLOGY ASSOCIATION FOR SCHOOL OF ELECTRONIC ENGINEERING

Oct. 2014 - Dec. 2015

- Provided technical support & hosted weekly workshops in embedded system programming & circuit design for undergraduate students

## Publications

### Pressure or Movement? Usability of Multi-Functional Foot-Based Interfaces

Sept. 2017

- Taeyong Kim, Hao Ju, and Jeremy Cooperstock. 2018. In proceedings of ACM SIGCHI Conference on Designing Interactive Systems (DIS) 2018. ACM. 1219-1227. <http://doi.acm.org/10.1145/3196709.3196759>

### A Data-Driven XGBoost-based Filter for Target Tracking

June 2018

- Bowen Zhai, Ming Li, Wei Yi, Hao Ju, and Lingjiang Kong. Poster presentation in IET International Radar Conference 2018.

## Selected Research Projects

### Limb-Based Interactive System for Older Adults

Montreal, Canada

STUDENT RESEARCHER, MCGILL UNIVERSITY

Oct. 2019 - Present

- Designing and developing a wearable limb-based input system for older adults, based on Arduino. A study on the difference between interaction habits among older adults and their younger peers is to be performed.

### CodeRhythm: A Multi-Sensory Programming Media

Hong Kong

RESEARCH ASSISTANT, CITY UNIVERSITY OF HONG KONG

Oct. 2018 - May 2019

- Designed and developed hardware and firmware for a set of musical building blocks based on Arduino and C. The system introduces basic programming ideas such as variables and programming sequences (loop, switch and sequential order, etc.) to visually impaired schoolchildren.
- Published at doi: 10.1007/978-3-030-49065-2\_23

### Thermal-Based Displaying Device for Visually Impaired Schoolchildren

Hong Kong

RESEARCH ASSISTANT, CITY UNIVERSITY OF HONG KONG

Aug. 2018 - Oct. 2018

- Designed and developed a thermal-based displaying device prototype based on peltier matrix, Arduino and C, set in the context of geographical education for visually impaired schoolchildren. Usability of the system (especially in picture displaying) compared with traditional Brailles.

### Target Recognition and Tracking based on XGBoost (Undergraduate Thesis)

Chengdu, China

UNDERGRADUATE RESEARCHER, UESTC

Oct. 2017 - May 2018

- Developed a supervised learning based target tracking algorithm and estimated its performance versus traditional target tracking algorithms (filtering algorithm: Kalman, LSM; target co-relating algorithms: JPDA, NNJPDA). Implemented in MATLAB and Python
- Received as poster presentation for IET International Radar Conference 2018

### Raising the Heat

Montreal, Canada

RESEARCH ASSISTANT, SHARED REALITY LAB, MCGILL UNIVERSITY

Sep. 2017 - Oct. 2017

- A set of hardware system using Electro-Muscular Stimulation to generate an illusion of burning-hot sensation.
- Improved temperature detection robustness and accuracy. Minimum increment of the prototype was improved from approximately 0.1 °C to 0.0625 °C by re-designing detection method, switching from thermal variable resistors to DS18B20 temperature sensor.

### Usability of Multi-Functional Foot-based Interfaces

Montreal, Canada

RESEARCH ASSISTANT, SHARED REALITY LAB, MCGILL UNIVERSITY

Jul. 2017 - Sep. 2017

- Compared the performance of two mainstream foot interaction methods (foot rocking and heel-pivoted rotation) in selection and parameter controlling tasks, set in the use case of a hands-free interface designed for seated musicians.
- Developed the hardware and firmware of the instrumented shoes using Arduino and C. Co-designed the menu layout in Unity using C#.
- Co-designed and conducted qualitative & quantitative usability study through interviews & NASA-TLX questionnaires.
- Published at ACM DIS'18 conference. <http://doi.acm.org/10.1145/3196709.3196759>

## Major Honors and Awards

### GRADUATE HONORS

#### Ethelwyn Crossley Memorial Scholarship

May 2019

CAD 4,620, ENTRANCE SCHOLARSHIP FOR TOP 10 IN ALL CANDIDATES.

#### Mitacs Globalink Graduate Fellowship

Mar 2019

CAD 15,000

### UNDERGRADUATE HONORS & AWARDS

#### Honorary Graduate of UESTC

Oct. 2017

10%

#### National Internet Security Scholarship

Aug. 2017

CNY 30,000 (USD 4,556), 100 AMONG ALL UNDERGRADUATES AND GRADUATE STUDENTS IN CHINA PER YEAR

#### 2017 'Internet Plus' Innovation and Entrepreneurship Competition

Jul. 2017

SECOND PRIZE (PROVINCIAL LEVEL), 7TH AMONG 125 TEAMS

#### National College Student 'Smarter Connected' System Innovation Competition

Jul. 2016

SECOND PRIZE OF SOUTHWEST CHINA AREA

## **2016 COMAP Interdisciplinary Contest In Modeling**

HONORABLE MENTION, 30 %

*Apr. 2016*