

# Hao Ju

MASTER'S STUDENT, FULL STACK RESEARCH ENGINEER

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## Skillsets

<b>Programming</b>	MATLAB, C, Python, VHDL, JavaScript, C#, HTML/CSS, Java
<b>Hardware tools</b>	Altium Designer, Quartus, Matlab Simulink, Multisim
<b>Design Tools</b>	Unity, AutoCAD, Adobe Illustrator, Figma
<b>Other Tools</b>	Microsoft Access, SPSS, RapidMiner
<b>Embedded Systems</b>	Arduino, STM32, Raspberry Pi, MCS 8051, Xilinx Virtex
<b>Courses</b>	Data Structure & Algorithms, Analog & Digital Systems, Signals and Systems, Digital Signal Processing, Information Systems Design, Usability Analysis & Assessment, Data Mining
<b>Languages</b>	Mandarin (native), English (fluent, IELTS 8.0), French (conversational)

## 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

#### Huawei Technologies

*Toronto, Canada*

RESEARCH INTERN

*Exp. May 2021 - Exp. Aug 2021*

- To design and develop sensors and corresponding data processing algorithms for smart wristbands

#### National Research Council of Canada

*Montreal, Canada*

RESEARCH INTERN

*Exp. Jan 2021 - Exp. April 2021*

- **Supervisor: Prof. David Tang**
- To design and develop visualization tools for network graphs & clustering analysis for researchers from non-engineering backgrounds.

#### Department of Electrical Engineering, University of California, Los Angeles

*Montreal, Canada*

RESEARCH ASSISTANT (REMOTE)

*Sept. 2020 - Present*

- **Supervisor: Prof. Yang Zhang**
- Designing and developing a system to perform hand activity sensing with wearable millimeter wave sensor TI IWR 1448 and Long Short-Term Memory (LSTM) algorithm.
- Currently building the data collection pipeline.

#### School of Information Studies, McGill University

*Montreal, Canada*

MASTER'S STUDENT, RESEARCH ASSISTANT

*Sept. 2019 - Present*

- **Supervisor: Prof. Karyn Moffatt**
- Designing, building, and troubleshooting the firmware and hardware of a wearable limb-based input system for older adults from scratch, using Arduino and Python.
- Due to COVID-19, we used a Wizard-of-Oz method, so that the experiment can be conducted remotely by mailing experiment materials to the participants' home contact-free. Built the mats embedded with pressure sensors to track foot movement using Arduino; Designed and built the interface displayed on screen using Python Tkinter and PySerial.
- Collecting and analysing performance data using the prototype and System Usability Questionnaire to qualitatively and quantitatively analyse the difference in interaction patterns, performances, and user preferences between older adults and their younger peers.

#### School of Creative Media, City University of Hong Kong

*Hong Kong S.A.R*

RESEARCH ASSISTANT

*Sept. 2018 - May 2019*

- **Supervisor: Prof. Kening Zhu**
- Provided technical support in Arduino programming and circuit design for other PhD students.
- Co-designed and co-conducted user study experiments.
- Designed, built, and troubleshoot hardware and firmware prototypes in the setting of classroom teaching for visually impaired schoolchildren, based on Arduino and C, e.g. thermal display systems for geographical education; musical building blocks that introduces basic programming ideas such as variables and programming sequences – loop, switch and sequential order, etc (follow-up published in DIS' 20 Companion, doi: 10.1145/3393914.3395895)

## School of Electrical Engineering, Univ. of Electronic Science & Technology of China

Chengdu, China

UNDERGRADUATE RESEARCHER, UESTC

Oct. 2017 - May 2018

- **Supervisor: Prof. Wei Yi**
- 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**.

## Department of Electrical and Computer Engineering, McGill University

Montreal, Canada

RESEARCH INTERN

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. doi: 10.1145/3196709.3196759**
- 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 oscilloscope manufacturer in China.

## TEACHING

### Senior Private Session Tutor

Montreal, Canada

EASY GROUP INC.

Sept. 2020 - April 2021

- Providing tailored one-on-one lectures on 100-300 level classes in Computer Science and Electrical & Computer Engineering.

### 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 includes demoing, tutoring, grading, and providing technical support for Digital Logic and VHDL programming.

## 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

### Limb-Based Interactive System for Older Adults

Exp. Nov. 2020

- Hao Ju and Karyn Moffatt. To be submitted to ACM International Conference on Ubiquitous Computing (UbiComp) 2021

### 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.

## 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

Apr. 2016

HONORABLE MENTION, 30 %