Hao **Ju**

Master's Student, Full Stack Research Engineer

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Skillsets

Programming	MATLAB, C, Python, VHDL, JavaScript, C#, HTML, Java
Tools	Altium Designer, Quartus, Simulink, SPSS, Unity 3D, AutoCAD, Adobe Illustrator, Figma
Embedded Systems	Arduino, STM32, Raspberry Pi, MCS 8051, Xlinx Virtex
Courses	Data Structure & Algorithms, Analog & Digital Systems, Digital Signal Processing, Data Mining, Usability Analysis & Assessment, Human Computer Interaction
Languages	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 includes 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: Designing Inclusive Tangible Programming Blocks *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.
- Follow-up work published in Companion Publication of the 2020 ACM Designing Interactive Systems Conference (DIS' 20 Companion). doi: 10.1145/3393914.3395895

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 *Apr. 2016*

Honorable Mention, 30 %