# Hao **Ju**

Master's Student, Full-Stack Research Engineer

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## Skillsets

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|---|---|
| **Programming** | MATLAB, C, Python (including OpenCV, SKLearn, Tensorflow), VHDL, JavaScript, HTML/CSS, Java |
| **Hardware Tools** | Altium Designer, Quartus, Simulink, Multisim |
| **Design Tools** | AutoCAD, Adobe Illustrator, Figma |
| **Data Analysis** | SPSS, Microsoft Access (SQL), Gephi, RapidMiner, PowerBi |
| **Embedded Systems** | Arduino, STM32, Raspberry Pi, MCS 8051, Xlinx Virtex |
| **UI/UX** | User study design, Semi-structured interviews, A/B testing, ANOVA, rapid prototyping |
| **Courses** | Data Structure & Algorithms, Applied Machine Learning, Information Systems Design, Usability Analysis & Assessment |
| **Languages** | Mandarin (native), English (fluent, IELTS 8.0), French (conversational) |

## Education

**School of Information Studies, McGill University** — *Montreal, Canada*

MISt in Information Studies, research-based — *Sept 2019 - Exp. May 2021*

- GPA: 3.77/4.0
- Area of specialization: Human Computer Interaction; Accessibility & User Experience; Wearable Devices

**School of Electronic Engineering, Univ of Electronic Sci & Tech of China (985,211)** — *Chengdu, P.R.China*

B.Eng. In Electrical 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 Experiences

### Research & Development

**Huawei Technologies** — *Toronto, Canada*

Research Intern (Incoming) — *Exp. May 2021 - Exp. Aug 2021*

- To design and develop sensors and corresponding data processing algorithms for smart wristbands, and perform corresponding user tests.

**National Research Council of Canada** — *Montreal, Canada*

Research Intern — *Jan 2021 - Exp. April 2021*

- Designing and developing visualization tools for network graphs & clustering analysis for researchers from non-engineering backgrounds, using Java and Gephi.
- Conduct corresponding user research.

**Dept. of Electrical and Computer Engineering, University of California, Los Angeles** — *Montreal, Canada*

Side research project (remote) — *Sept. 2020 - Jan 2021*

- Designed and tried to develop a system to perform hand activity sensing with wearable millimeter wave sensor TI IWR 1448 and machine learning algorithm Long Short-Term Memory (LSTM).

**School of Information Studies, McGill University** — *Montreal, Canada*

Research Assistant — *Sept. 2019 - Present*

- Designed, built, and troubleshot firmware & hardware of a wearable limb-based input system from scratch
- Due to COVID-19, we made some technical trade-offs 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, semi-structured interviews, 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, P.R.China*

Research Assistant — *Sept. 2018 - May 2019*

- Provided technical support in Arduino programming and circuit design & troubleshooting for other PhD students.
- Designed and developed hardware and firmware prototypes for visually challenged schoolchildren 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.

**Dept. of Electrical and Compute Engineering, McGill University** *Montreal, Canada*

Research Intern *July 2017 - Oct. 2017*

- Developed the hardware and firmware of a foot-based interactive system based on Arduino, C, and VICON for seated musicians. Co-designed the menu layout in Unity using C#. Co-designed and conducted qualitative & quantitative usability study through interviews & NASA-TLX questionnaires.
- 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.

### Outreach & Leadership

**Core Member, Technical Volunteer** *Chengdu, P.R.China*

Technology Association for School of Electronic Engineering *Oct. 2014 - Dec. 2015*

- Provided technical support and hosted weekly workshops on circuit design & manufacturing (PCB boards design, CNC Machines, laser cutting, 3d printing. etc); and embedded system programming in C & VHDL

### Teaching

**Senior Session Lecturer** *Montreal, Canada*

Easy Education Inc. *Oct. 2020 –*

- Providing tailored lectures on Data Structures and Algorithms in Java and Python.
- One of the most responsible & enthusiastic lectures rated by students.

**Teaching Assistant** *Montreal, Canada*

Department of Computer Science, McGill University *Jan.2021 - Exp. May 2021*

- Teaching Assistant of COMP250 Intro to Computer Science. Providing tutorials, labs, and technical supports for students on Data Structure and Algorithms in Java. Designing homework assignments and lab assignments in Java.

**Teaching Assistant** *Montreal, Canada*

Department of Electrical and Computer Engineering, McGill University *Sept.2020 - Exp. May 2021*

- Teaching Assistant of ECSE222 Digital Logic. Teaching, demoing, designing assignments, and providing technical support for students in VHDL. Received high ratings from students taught.

### Production & Quality Control

**Production Management Intern** *Shenzhen, P.R.China*

Siglent Technologies *Aug. 2016*

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

## Publications

**Limb-Based Interactive System for Older Adults** *Exp. Feb. 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. doi: 10.1145/3196709.3196759

**A Data-Driven XGBoost-Based Filter for Target Tracking** *July 2018*

- Bowen Zhai, Wei Yi, Ming Li, Hao Ju, and Lingjiang Kong. The Journal of Engineering, 2019(20):6683-6687,2019, doi: 10.1049/joe.2019.0174

## Selected Honors and Awards

**Ethelwyn Crossley Memorial Scholarship, CAD 4,620** *May 2019*

**Mitacs Globalink Graduate Fellowship, CAD 15,000** *Mar 2019*

**National Internet Security Scholarship, CNY 30,000 (Approx. CAD 6,000)** *Aug. 2017*

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** *July 2016*

Second Prize of Southwest China Area

**2016 COMAP Interdisciplinary Contest In Modeling, Honorable Mention** *Apr. 2016*