# Hao **Ju**

Full-Stack Research Engineer; she/her/hers

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## **Ski**llsets

| | |
|---|---|
| **Programming** | MATLAB, Python (including OpenCV, SKLearn, Tensorflow), C, VHDL, JavaScript, HTML, Java |
| **Data Analysis & Visualization** | SPSS, Microsoft Access (SQL), Gephi, D3, RapidMiner, Excel, PowerBi |
| **UI/UX Research** | User study design, Semi-structured interviews, A/B testing, ANOVA, rapid prototyping |
| **Design Tools** | AutoCAD, Adobe Illustrator, Figma |
| **Hardware Tools** | Altium Designer, Quartus, Simulink, Multisim |
| **Embedded Systems** | Arduino, STM32, Raspberry Pi, MCS 8051, Xlinx Virtex |
| **Courses** | Data Mining, Applied Machine Learning, Information Systems Design, Usability Analysis & Assessment |
| **Languages** | Mandarin (native), English (fluent, IELTS 8.0), French (conversational) |

## **Edu**cation

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

MISt in Information Studies, research-based *Sept 2019 – May 2021*
- GPA: 3.82/4.0, final year 3.9/4.0
- Area of specialization: Human Computer Interaction; Accessibility & User Experience;

**School of Electronic Engineering, Univ of Electronic Sci & Tech of China (985,211)** *Chengdu, 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 (top 10% in major)

## **Sel**ected Experiences

### RESEARCH & DEVELOPMENT

**2012 Labs, Huawei Technologies** *Toronto, Canada*

Support Researcher, Intern *April 2021 –*
- Design and develop sensors and corresponding data processing algorithms for voice-controlled digital home solutions using **Python**; Perform corresponding **user-centered design and conduct user experiments**.
- Visualize data collected and feature calculated to select the best-performing features for the excessive trees algorithm. Successfully **raised model accuracy from 62% to 96%** by feature engineering.

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

Research Intern, Co-op *Jan 2021 - April 2021*
- Designed and developed the prototype of a **visualization tool for network graphs & clustering analysis on the browser** for researchers from non-engineering backgrounds **based on Gephi** using **Java** in the backend.
- The system allows users to access and interact with the mother branch of the project remotely using TCP-IP Protocol. It also allows timeline and hierarchy display of a graph, allowing roll-ups and drill-ins, similar to that used in the KeyLine.
- Conduct corresponding **user research**.

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

Research Assistant *Sept. 2019 - May 2021*
- Designed, built, and troubleshot firmware & hardware of a wearable limb-based input system from scratch **using Arduino, C and Python**.
- 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.
- Collected and analysed 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, 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**.

**School of Electrical Engineering, Univ. of Electronic Science & Technology of China** *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**. Published in **The Journal of Engineering, doi: 10.1049/joe.2019.0174**.

**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**. 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.

## OUTREACH & LEADERSHIP

**Core Member, Technical Volunteer** *Chengdu, 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 - May 2021*
- Teaching Assistant of COMP250 Intro to Computer Science. **Providing technical supports for students** on **Data Structure and Algorithms** in **Java** during class and office hours. **Designing homework assignments and lab assignments** in Java with other TAs.

**Teaching Assistant** *Montreal, Canada*

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, MCGILL UNIVERSITY *Sept.2020 - 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, China*

SIGLENT TECHNOLOGIES *Aug. 2016*
- Co-managed production and quality control process with full-time employees at the leading Chinese oscilloscope manufacturer

# 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. 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*

**Honorary Graduate of UESTC** *Oct. 2017*

TOP 5 IN MAJOR.

**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*