Hao **Ju**

Full-Stack Research Engineer; she/her/hers

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Skillsets

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)

Education

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)

Selected Experiences

Research & Development

Amazon Canada — *Toronto, Canada*

Software Development Engineer (incoming) — *Exp. Feb. 2022*

- Conduct **development and maintenance** of the online payment system using **Python and Java**.

2012 Labs, Huawei Technologies — *Toronto, Canada*

Support Researcher — *April 2021 – Jan. 2022*

- Designed and developed 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 – Sept. 2021*

- 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. **Leading small group discussions**.**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**. **Leading small group discussions**. 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*