Jessica YI FEI Bo

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***Researcher**, **engineer**, and **designer** with multidisciplinary experiences in robotics, software engineering, medical device development, and entrepreneurship. My research interests broadly intersect with **human-centered design** of **intelligent systems**. Currently, I am working on **perception** and **learning** for autonomous robots.*

EDUCATION

ETH Zurich | MSc Mechanical Engineering, Robotics concentration — *Expected 2022*
Coursework: Probabilistic Artificial Intelligence, 3D Vision, Information Systems, Human Factors

University of British Columbia | BASc Mechanical Engineering, Biomedical option — *May 2020*
Thesis: Wheelchair Detection and State Estimation using Laser Scanning Sensors for Mobile Robots
Coursework: Machine Learning, Algorithms, Data Structures, Mechanical Design, Instrumentation

RESEARCH & INDUSTRY EXPERIENCE

Visual Intelligence and Learning Lab, EPFL | Supervisor: Prof. Amir Zamir — *Summer 2021*
Research Assistant for Summer@EPFL
- Incoming research assistant at VILAB for perception for reinforcement learning in robotics

Diaxxo AG, Functional Materials Lab, ETH Zurich | Supervisor: Dr. Michele Gregorini — *Spring 2021*
***Software Research Assistant** (Part-Time "Hilfsassistentin")* — *Python, matplotlib, NumPy, controls*
- Developing and managing the Python codebase for a rapid desktop PCR machine under development

CARIS Robotics Lab, UBC | Supervisor: Prof. Machiel Van der Loos — *Fall 2019 – Spring 2020*
Robotics Research Assistant — *ROS, Python, MATLAB, scikit-learn, TensorFlow, pandas*
- Proposed a wheelchair state estimation algorithm to improve safety in interactions with mobile robots
- Used a multi-class neural network to predict wheelchair orientation from 2D laser data with 86% accuracy

Coursera | Team: Payments Engineering & B2C Decision Science — *Summer 2020*
Software Engineering Intern — *Scala, Python, SQL, REST, statistical analysis*
- Led the backend consolidation of billing information for 6.5M+ monthly transactions in a RESTful API
- Analyzed 900+ A/B experiments and causally identified patterns in statistically significant revenue patterns

Amazon | Team: Underserved Populations Engineering — *Summer 2019*
Software Development Engineering Intern — *Java, Spring, AWS (SNS, SQS, Lambda)*
- Designed a backend pipeline using AWS services to guarantee real-time event polling and delivery
- Implemented an event-processing service in Java for 120k+ annual Amazon membership events

Blackberry QNX (Autonomous Vehicle Innovation Centre) | Supervisor: Gordon Bell — *Fall 2018*
Autonomous Vehicle Research & Development Co-op Student — *C, MATLAB, QNX, LiDAR*
- Developed a LiDAR processing algorithm that detects road signs and free space with < 10 ms runtime
- Applied projective geometry to 3D LiDAR point cloud to fuse with 2D camera image for visualization at CES

CERTEC Group, Lund University | Supervisor: Dr. Héctor Caltenco — *Summer 2017*
Rehabilitation Engineering Research Assistant — *Arduino, sensors, fabrication, user testing*
- Prototyped a hand spasticity rehabilitation device that provides stimulating motion-triggered feedback
- Integrated real-time control of a computer keyboard using hand movements with accelerometers and Arduino

CONFERENCE ABSTRACTS

Bo, J. (2020). Detection of Wheelchairs Using Laser Scanning Sensors for Mobile Robotics. In *Multidisciplinary Undergraduates Research Conference 2020.* *(Best Oral Presentation)*

Gwara, M., Tsang, V. L., Thompson, C. A., Smith, S., **Bo, J.**, Fletcher, S., Janusz, N., Chew, S. Y., Janusz, M., Thompson, C. K., Bertrand, M., Woods, H., Thompson, C. (2018). Use of Centralized Electronic Medical Records System in Paediatric Care. In *American Academy of Pediatrics 2017.*

Technical Projects

Attentiv Medical | attentivmedical.com — *Fall 2019 – Present*
Co-Founder and Research Lead — *Python, scikit-learn, NumPy, pandas, sensors, medical device*

- Designed a patentable bioelectric sensor and real-time monitoring system for detecting IV infiltration
- Achieved 100% accuracy in blood-tissue differentiation using an SVM model for proof-of-concept prototype
- Led 80+ user and expert interviews to determine engineering, regulatory, and clinical design requirements

Awards: *James Dyson National Winner ($3k) and International Top 20, Microsoft Discover AI – Healthcare Winner ($6k), Medical Device Design Center – Principal Award ($5k), UBC Innovation on Board Start-Up Competition Runner Up ($2.5k), New Venture Design Best Project ($800), New Venture Design Industry Award ($600), RBC Get Seeded Winner ($500)*

H4ptic Sensory Feedback Prosthesis | Hatching Health — *Spring 2019*
Research Lead — *Arduino, sensors, sensory substitution*

- Designed a sensory substitution device for prosthetic users that converts force to haptic feedback
- Researched sensory feedback method that leverages neuroplasticity and somatosensory cortex remapping

Awards: *UBC Applied Science Best Technical Innovation ($1k), Hatching Health Runner Up*

HoloLens Point Cloud Registration | ETH Zurich 3D Vision — *Spring 2018*
Project Course Member — *MATLAB, HoloLens*

- Adapted the "Guaranteed Outlier Removal" point cloud registration algorithm with "Iterative Closest Point" algorithm to reduce HoloLens 3D point cloud alignment errors with MATLAB

FraXure | UBC Biomedical Engineering Student Team — *Fall 2016 – Summer 2019*
Research & Mechanical Team Member — *CAD, prototyping, biomechanical analysis*

- Prototyped and tested a low-cost femur fracture traction device for low-resource hospital settings
- Conducted extensive literature review into deep tissue injuries to optimize interface design for safety

Awards: *International Conference on Engineering Design 2017 - Design Fair Runner Up, Medical Device Design Center Excellence Awards Finalist, Rice University 360° Global Health Design Competition Finalist*

Skills

Software: Python, Java, Scala, C/C++, ROS, MATLAB, SQL, AWS, REST, Arduino, QNX, Linux
Libraries: TensorFlow, PyTorch, scikit-learn, NumPy, pandas, matplotlib, SciPy
Engineering: SolidWorks, Fusion360, ANSYS, Arduino, 3D printing, soldering, instrumentation

Awards

2020	**Order of the White Rose Scholarship Finalist** – *Nominated by UBC Applied Science*
2020	**Top 5% Academic Ranking** – *UBC Applied Science and Mechanical Engineering*
2020	**Canada Graduate Scholarships-Master's** ($17,500, *declined*) – *NSERC Canada*
2019, 2020	**Speak Out for Engineering Americas** (1st Place) – *Institution of Mechanical Engineers*
2019	**Women in Technology Scholarship** ($10,000) – *IKB BC Scholarship Society*
2017	**Go Global Research Abroad Programs Award** ($2000) – *University of British Columbia*
2016	**NSERC Experience Award** ($4500) – *NSERC Canada*
2014 – 2020	**UBC Dean's Honour List** – *University of British Columbia*

Advisory & Mentorship

connect-f, nwPlus | **STEM Mentor** — *2020 – Present*

- Mentoring high school students in exploring an education and career in engineering and computer science

International Children's Advisory Network (iCAN) | **Conference Committee Chair** — *2014 – 2019*

- Led a 10+ member international team to plan events and fundraisers for the annual iCAN Summits
- Reviewed and improved upon European Medicine Agency's pediatrics clinical research policies

Kidscan Youth Advisory Council | **Youth Advisor & Mentor** — *2013 – 2018*

- Advised 10+ Vancouver research teams on promoting youth involvement in pediatrics research
- Reviewed Canada-wide policies for standardizing clinical pediatrics research consent/assent protocol