

Jessica Yi Fei Bo

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

EDUCATION

- ETH** **ETH Zurich** | MSc Mechanical Engineering, Robotics concentration Expected 2022
Coursework: Probabilistic Artificial Intelligence, 3D Vision, Human Factors, Mixed Reality, Computer Vision
- UBC** **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 Python, PyTorch
 - Investigating the perceptual capacities developed by robotic agents through reinforcement learning
- CARIS Robotics Lab, UBC** | Supervisor: Prof. Machiel Van der Loos Fall 2019 – Spring 2020
Robotics Research Assistant ROS, Python, MATLAB, scikit-learn, TensorFlow
 - 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, Decision Science Summer 2020
Software Engineering Intern Scala, Python, SQL, 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: Amazon Marketplace 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

PUBLICATIONS

Conference Papers

- Bo, J**, Van der Loos, HFM (2021). Detection of Wheelchair Orientation in Human-Robot Interactions. In proceedings of *International Conference BIOMDLORE 2021*.

Conference Abstracts

- Bo, J** (2020). Detection of Wheelchairs Using Laser Scanning Sensors for Mobile Robotics. In proceedings of *Multidisciplinary Undergraduates Research Conference 2020*. (*Best Oral Presentation*)
- Gwara, M, Tsang, VL, Thompson, CA, Smith, S, **Bo, J**, Fletcher, S, Janusz, N, Chew, SY, Janusz, M, Thompson, CK, Bertrand, M, Woods, H, Thompson, C (2018). Use of Centralized Electronic Medical Records System in Paediatric Care. In proceedings of *American Academy of Pediatrics 2017*.

TECHNICAL PROJECTS

Attentiv Medical | attentivmedical.com

Fall 2019 – Present

Co-Founder and Research Lead

Python, scikit-learn, sensors, medical device

- Designed a patentable bioelectric sensor and real-time monitoring system for detecting IV infiltration
 - 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)*

“Into the Forest” Game | ETH Zurich – Virtual Reality

Spring 2021

Art Direction and Game Integration

Unity, Blender, C#

- Designed an immersive and multimodal web-based escape game through creating concept art, storyboards, Blender models, and Unity environments. Try out the [game demo](#).

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 in MATLAB to reduce HoloLens 3D point cloud alignment errors

SKILLS

Software: Python, Java, Scala, C/C++, ROS, MATLAB, SQL, AWS, REST, Arduino, QNX, Linux, Unity, Blender

Libraries: PyTorch, scikit-learn, NumPy, pandas, matplotlib, Tensorflow,

Engineering: SolidWorks, Fusion360, ANSYS, Arduino, 3D printing, soldering, instrumentation

AWARDS

2021	Heyning-Roelli Mobility Grant (1100 SFr.) – Heyning-Roelli Foundation
2021	EPFL Summer Research Fellowship (4800 SFr.) – École polytechnique fédérale de Lausanne
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 CAD, declined) – NSERC Canada
2019, 2020	Speak Out for Engineering Americas (1 st Place, £300) – Institution of Mechanical Engineers
2019	Women in Technology Scholarship (\$10,000 CAD) – IKB BC Scholarship Society
2017	Go Global Research Abroad Programs Award (\$2000 CAD) – University of British Columbia
2016	NSERC Experience Award (\$4500 CAD) – NSERC Canada
2014 – 2020	UBC Dean’s Honour List – University of British Columbia

ADVISORY & MENTORSHIP

connect-f, nwPlus | STEM Mentor

2021 – 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

2020 – Present

- 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

2014 – 2019

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