Jessica Yi Fei Bo

CONTACT

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RESEARCH INTERESTS

Theme: Human-centered design of intelligent systems
Competences: Deep learning, physiological sensing, user studies
Applications: Medical devices, robotics, mixed reality

EDUCATION

ETH Zurich, Zurich, Switzerland
MSc. Mechanical Engineering (Robotics), 2022
Thesis at **Massachusetts Institute of Technology** and **Harvard Medical School**: "Improving Deep Learning Model Generalizability with Adversarial Augmentations for Time-Series Physiological Data"
Advisors: Prof. Giovanni Traverso, Dr. Hen-Wei Huang, Dr. Peter Chai

University of British Columbia, Vancouver, BC, Canada
BASc. Mechanical Engineering (Biomedical), 2020
UBC Dean's Honour List in all academic years
Thesis: "Wheelchair detection and state estimation using laser scanning sensors for mobile robots"
Advisor: Prof. Machiel Van der Loos

AWARDS & HONOURS

Graduate Research Grant, IEEE Computational Intelligence Society, 2022
Master Thesis Grant, Zeno Karl Schindler Foundation, 2022
Swiss-European Mobility Scholarship, Swiss-European Mobility Programme, 2022
Heyning-Roelli Mobility Grant, Heyning-Roelli Foundation, 2021
Summer@EPFL Research Fellowship, École polytechnique fédérale de Lausanne, 2021
ICLR 2021 Conference Attendance Scholarship, Google, 2021
Order of the White Rose Scholarship Finalist , UBC Applied Science, 2020
Top 5% Academic Ranking, UBC Applied Science and Mechanical Engineering, 2020
Canada Graduate Scholarships-Master's (declined), NSERC Canada, 2020
Graduate Entrance Grant (declined), UBC Designing for People Group, 2020
Speak Out for Engineering Americas 1st Place, Institution of Mechanical Engineers, 2019
Women in Technology Scholarship, Irving K Barber BC Scholarship Society, 2019
NSERC Experience Award, NSERC Canada, 2016

JOURNALS PUBLICATIONS

Vinker Y, Pajouheshgar E, **Bo J**, Bachmann R, Bermano AH, Cohen-Or D, Zamir A, Shamir A (2022). "CLIPasso: Semantically Aware Object Sketching". ACM Transactions on Graphics. Best Technical Paper at SIGGRAPH 2022.

CONFERENCE PUBLICATIONS

Bo J, Ta K, Nishida R, Yeh G, Tsang V, Bolton M, Ranger M, Walus K (2022). "ATTENTIV: Instrumented Peripheral Catheter for the Detection of Catheter Dislodgement in IV Infiltration". 44th Annual International Conference on the IEEE Engineering in Medicine and Biology Society.

Agrawal D*, Lobsiger J*, **Bo J,** Kaufmann V, Armeni I (2022). "HoloLabel: Augmented Reality User-In-The-Loop Online Annotation Tool for As-Is Building Information". European Conference on Computing in Construction 2022.

Bo J, Van der Loos HFM (2021). "Detection of Wheelchair Orientation in Human-Robot Interactions". 13th International Conference BIOMDLORE 2021.

ABSTRACTS

Bo J, Huang HW, Chan A, Traverso G (2022). "Adversarial Masking for Pretraining ECG Data Improves Downstream Model Generalizability". Machine Learning for Health Symposium 2022 *and* Learning from Time Series for Health Workshop at NeurIPS 2022.

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

INVITED TALKS

"Wheelchair Detection and State Estimation using Laser Scanning Sensors for Mobile Robots", School of Biomedical Engineering Seminar, University of British Columbia, 2020.

RESEARCH EXPERIENCES

Massachusetts Institute of Technology, Cambridge, MA, USA
Visiting Research Student in the Traverso Lab | February – December 2022

- Working with Prof. Giovanni Traverso and Dr. Henwei Huang to develop adversarial augmentations for clinical time-series data to improve deep learning generalizability.
- Working with Dr. Peter Chai to investigate the patient-perceived ethics and acceptability of a novel implantable medical device.

Funded by the IEEE CIS Graduate Research Grant, the Heyning-Roelli Foundation Mobility Grant, the Zeno Karl Schindler Master's Thesis Grant, and the Swiss-European Mobility Scholarship.

Published 1st author "Adversarial Masking for Pretraining ECG Data Improves Downstream Model Generalizability" as a non-archival abstract in ML4H Symposium 2022 and NeurIPS TS4H Workshop 2022.

École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland
Research Assistant in the Visual Intelligence and Learning Laboratory | May – August 2021

- Worked with Prof. Amir Zamir to investigate perceptual capabilities developed by reinforcement learning agents trained on embodied navigation tasks.
- Developed an abstract sketch synthesis tool with collaborators at Tel Aviv University.

Published "CLIPasso: Semantically Aware Object Sketching" in SIGGRAPH 2022.

Attentiv Medical, Vancouver, BC, Canada
Co-Founder and Research Lead | January 2020 – August 2022

- Worked with Prof. Konrad Walus and Prof. Manon Ranger to design a patentable bioelectric sensor and real-time monitoring system for detecting IV failures and led 80+ user and expert interviews to determine engineering, regulatory, and clinical design requirements.

Awards: James Dyson National Winner (Canada) and International Top 20, Microsoft Discover AI - Healthcare Winner, Medical Device Design Center Principal Award, UBC Innovation on Board Start-Up Competition (Runner Up)

Published 1st author "ATTENTIV: Instrumented Peripheral Catheter for the Detection of Catheter Dislodgement in IV Infiltration" in EMBC 2022.

University of British Columbia, Vancouver, BC, Canada
Research Assistant in CARIS Robotics Lab | September 2019 – May 2020

- Worked with Prof. Machiel van der Loos to develop a wheelchair orientation and state estimation algorithm to improve human-robot interaction safety using laser scanning sensors.

Published 1st author "Detection of Wheelchair Orientation in Human-Robot Interactions" in BIOMDLORE 2021.

Lund University, Lund, Sweden
Research Assistant in the CERTEC Group | May – June 2017

- Worked with Dr. Héctor Caltenco to prototype a hand spasticity rehabilitation device that provides motion-triggered feedback and real-time control of a computer keyboard.

INDUSTRY EXPERIENCES

Coursera, Toronto, ON, Canada (remote)
Software Engineering Intern | May – August 2020

- Led the backend consolidation of billing information for 6.5M+ monthly transactions.
- Analyzed 900+ A/B experiments to identified statistically significant revenue patterns.

Amazon, Vancouver, BC, Canada
Software Engineering Intern | May – July 2019

- Designed a backend pipeline using AWS services to guarantee real-time event polling.
- Implemented an event-processing service in Java for 120k+ annual membership events.

Blackberry QNX, Ottawa, ON, Canada
3D Vision R&D Intern | September – December 2018

- Developed a LiDAR processing algorithm that detects road signs and free space in real-time.
- Fused 3D LiDAR point cloud data with 2D camera images for visualization at CES 2019.

SERVICE AND VOLUNTEERING

Machine Learning Corner, Traverso Lab, Cambridge, MA, USA
Founder and Organizer of Reading Group | March 2022 – ongoing

Open Roboethics Institute, Montreal, QC, Canada (remote)
Competitions & AI Fairness Toolkit Team | September 2021 - ongoing

Connect-F Mentorship Program, Vancouver, BC, Canada (remote)
STEM Mentor for High School Students | September 2020 – September 2021

International Conference on Engineering Design 2017, Vancouver, BC, Canada
Conference Volunteer | August 2017

UBC Biomedical Engineering Student Team, Vancouver, BC, Canada
Research Team for Orthopedic Medical Device | October 2016 – May 2020

UBC Engineering Undergraduate Society, Vancouver, BC, Canada
Graphic Designer for Event Communications | September 2015 – May 2018

UBC Orbit Satellite Design Student Team, Vancouver, BC, Canada
Satellite Orbital Controls Team | September 2015 – May 2016

International Children's Advisory Network, Worldwide
Conference Committee Chair and Youth Council | August 2015 – December 2019

Kidscan Youth Advisory Council, Vancouver, BC, Canada
Youth Advisor for Pediatric Research | January 2014 – December 2019

SKILLS

Programming: Python, PyTorch, Java, MATLAB, SQL, ROS, Linux, AWS

Engineering: Unity, Blender, HoloLens, AWS, Arduino, CAD, fabrication, video editing