

YUNI FUCHIOKA

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EDUCATION

ETH Zürich, Robotic Systems Lab

PhD, Mechanical and Process Engineering

January 2024 –
Zürich, Switzerland

- Supervisors: Professor Marco Hutter, Professor Michiel van de Panne.
- Research interests: Teleoperation, reinforcement learning, quadruped locomanipulation.

University of British Columbia

Master of Science, Computer Science

September 2021 – May 2023
Vancouver, Canada

- Supervisor: Professor Michiel van de Panne.
- Thesis Title: Imitating Optimized Trajectories for Dynamic Quadruped Behaviors.
- Thesis Link: <http://hdl.handle.net/2429/84355>

University of British Columbia

Bachelor of Applied Science, Engineering Physics (with distinction)

September 2015 – May 2021
Vancouver, Canada

- Fully accredited engineering program covering topics in mechanical, electrical, and software engineering, and its connection to foundational physics and mathematics.
- Elizabeth and Leslie Gould Scholarship in Engineering.
- Dean's Honour List Designation (received every academic year).

WORK EXPERIENCE

Research Intern, Robotics Group

OMRON SINIC X

June 2023 – December 2023
Tokyo, Japan

- Researched sensing and control methods for industrial contact-rich manipulation, using tactile sensors and passive compliance. Supervisor: Dr. Masashi Hamaya.

Research Intern, Humanoid Robotics Group

Honda Research Institute Japan/Honda R&D

June 2018 – April 2019
Tokyo, Japan

- Researched methods for modelling and controlling bipedal locomotion through geometric nonlinear control, feedback linearization, and template models, as applied to planar biped systems. Supervised by Dr. Chunjiang Fu.

Strategic Reporting and Data Migration Intern

UBC Information Technology

January 2017 – April 2017
Vancouver, Canada

- Programmed web-based data visualizations and developed a prototype web application for centralized master data management, for a university-wide project to replace the legacy student information system.

Mechanical Part Inspector

Kodak Canada

July 2016 – August 2016
Burnaby, Canada

- Inspected CNC-machined laser components with micrometer-scale tolerances for defects and reported findings to production engineers, for a manufacturing plant that produced industrial offset printers.

PUBLICATIONS

Robotic Object Insertion with a Soft Wrist through Sim-to-Real Privileged Training

Yuni Fuchioka, Cristian C. Beltran-Hernandez, Hai Nguyen, and Masashi Hamaya

International Conference on Intelligent Robots and Systems (IROS), 2024

Website: <https://omron-sinicx.github.io/soft-robot-sim-to-real/>

An Electromagnetism-Inspired Method for Estimating In-Grasp Torque from Visuotactile Sensors

Yuni Fuchioka and Masashi Hamaya

International Conference on Robotics and Automation (ICRA), 2024

Website: <https://omron-sinicx.github.io/tactile-dipole-moment/>

OPT-Mimic: Imitation of Optimized Trajectories for Dynamic Quadruped Behaviors

Yuni Fuchioka, Zhaoming Xie, and Michiel van de Panne

International Conference on Robotics and Automation (ICRA), 2023

Website: <https://www.cs.ubc.ca/~van/papers/2022-opt-mimic/index.html>

OTHER PROJECTS

ALMA Teleoperation System for the AIRA Challenge

January 2024 – June 2024

PhD Project, Robot Competition Entry

- Led a team to win third place in the 2024 Advanced Industrial Robotic Applications (AIRA) Challenge, which involved developing a remote teleoperation system for the ALMA quadruped manipulator robot, used for mock chemical plant inspection tasks.

Block Coordinate Descent for 2D Quadruped Centroidal Dynamics

January 2022 – April 2022

Graduate Course Project, EECE 571Z: Convex Optimization

- Modified and implemented the methods of the paper "Rapid Convex Optimization of Centroidal Dynamics using Block Coordinate Descent" by Shah et al. 2021 for a simplified 2D quadruped model.

Gibbon Pose Estimation from Videos

September 2021 – December 2021

Graduate Course Project, CPSC 533R: Visual AI

- Evaluated two 2D pose estimation methods from research literature on videos of brachiating gibbon monkeys, characterizing the various pre- and post-processing techniques needed to account for the challenge of limited, low quality training data and the necessity to adapt research techniques to real-world problems.

Bicopter Drone

May 2019 – August 2019

Personal Hobby Project

- Designed and built a radio controlled drone that flies using only two propellers, using limited financial and fabrication resources. Programmed an Arduino for stable flight control, rather than using an off-the-shelf flight controller.

Autonomous Robot Competition

June 2017 – August 2017

Undergraduate Course Project

- Designed and built a robot for a 6 week design competition within a 4 member team, placing 4th out of 16 teams. The robot was required to follow a taped track, grasp objects, and place them on a target location autonomously with no remote control.

TEACHING

Teaching Assistant , CPSC 426: Computer Animation	Spring Term 2021–2022
Teaching Assistant , PHYS 170: Mechanics I	Winter Term 2020–2021
Teaching Assistant , PHYS 170: Mechanics I	Spring Term 2019–2020

SERVICE

Reviewer: ICRA 2023, ICRA 2024, IROS 2024.

SKILLS

Programming Languages	Python, C++, MATLAB, Java
Numerical Computing Libraries	PyTorch, CasADi, Numpy, Eigen, IPOPT
Commercial Robots	UR5e, xArm6, Solo 8, ANYmal, DynaArm
Simulators	Raisim, MuJoCo (Robosuite), PyBullet
Robotics Software	ROS1, Git, Ubuntu Linux
Mechatronics	Machine shop, Electrical prototyping, CAD (Onshape, Solidworks)
Spoken Languages	English (primary language), Japanese