CURRICULUM VITAE

Huiyi (Cheryl) Wang *Feb 2025*

PERSONAL INFORMATION

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DEGREES

McGill University, Faculty of Engineering *Sep 2023 - Present*
Doctor of Philosophy in Mechanical Engineering with focus on Robotics Control with State of Art Machine Learning (ML) Technique

McGill University, Trottier Space Institute at McGill (TSI) *Sep 2021 – Aug 2023*
MSc Physics with Thesis GPA: 4.00/4.00
Thesis: Constraining the Formation Scenario of Earth through Imprints of Primordial Solar Nebula within the Deep Mantle.

University of California, Los Angeles (UCLA) *Sep 2017 – Mar 2021*
Bachelor of Science in Astrophysics, with Honors GPA: 3.70/4.00
Honor Thesis: Gravitational-Wave Signatures from Compact Object Binaries in the Galactic Center

TECHNICAL SKILLS

Coding Language: Python, C++, C#, Java (basic), MATLAB, PyTorch
Skills: Reinforcement Learning, Dynamic Programming, Sequential Decision Making, Deep Learning, Generative AI, Robotics, Muscle Driven Simulations, Musculoskeletal Modeling, Computer Visions
Certificate: Amazon Web Service (AWS) Certified Machine Learning – Specialty (Certificate)

RESEARCH & PROFESSIONAL EXPERIENCE

MyoSuite - Developing Physiological Accurate Controller for Elderly *Sep 2023 – Dec 2024*
Ph.D. Researcher & Developer, MyoSuite, Hybrid, Montreal

- Developed a 210-muscle actuated MyoBack model in MyoSuite, integrating with current lower limb model (80 actuators) to achieve a full body neuromusculoskeletal model that is controllable.
- Implemented Proximal Policy Optimization (PPO) with MyoSuite musculoskeletal model to replicate aging conditions such as sensorimotor delay and sarcopenia in virtual agent balancing task.
- Designed a Hierarchical RL framework to model human decision-making in balance control, improving humanoid robots' adaptability and stability in dynamic environments.

MyoChallenge – NeurIPS Competition Track
Organizer & Performance Baseline Provider *Sep 2023 – Dec 2024*

- Initiated a global competition host at NeurIPS that reaches more than 15 countries and receives more than 500 submissions worldwide by organizing tutorials, workshops and managed a team of advocacy of 20+ people.
- Led the manipulation track to build a customized reinforcement learning environment with musculoskeletal simulation agent for MyoChallenge that rapidly prototypes, tests, and refines advanced algorithms that control musculoskeletal agents in real-time ***(Open-source project available at MyoHub)***.
- Streamlined the full software development life cycle at production level, from architectural design to deployment via PyPI to foster broad utilization in robotics and biomechanical research and development.

Reinforcement Learning with UR10e Robotic Arms
Internship, National Research Council Canada, Ottawa *May 2024 - Dec 2024*

- Pioneered the first Gym environment integrating the UR10e robotic arm for specialized pick-and-place tasks with transparent objects in a chemistry lab setting.

- Led the integration of offline and online training for goal-based robotic manipulation, resulting in a robust 25% improvement in the adaptive accuracy of the Robotiq 2F-85 gripper in sim to real transfer.
- Developed advanced motion planning and predictive control algorithms for the UR10e robotic arm, employing computer vision and transparent object segmentation to increase grasping precision and speed by 20%.

Smart Bird ID - Image/Soundtrack Classification *May 2023 - Aug 2023*

Internship, Cardinal Jaune Inc., Montreal

- Devised and fine-tuned a Recurrent Neural Network (RNN) algorithm, resulting in a 10-20% improvement in image and audio classification accuracy across 100+ bird species using Keras, TensorFlow toolkit
- Successfully deployed custom machine learning models on Android application store using Android Studio.

PUBLICATION

1. **Wang, H.,** Stephan, A. P., Naoz, S., et al. 2021. *"Gravitational-Wave Signatures from Compact Object Binaries in the Galactic Center."* https://iopscience.iop.org/article/10.3847/1538-4357/ac088d
2. **HUIYI WANG**, Fahim Shahriar, et al. "*Versatile and Generalizable Manipulation via Goal-Conditioned Reinforcement Learning with Grounded Object Detection*", CoRL 2024 Workshop on Mastering Robot Manipulation in a World of Abundant Data
3. Fahim Shahriar, **HUIYI WANG,** et al. *"Simplifying Goal Representations with Masks in Vision-based Reinforcement Learning"*, RLC 2025 Conference Paper (Submitted)
4. Chun Kwang Tan, **Cheryl Wang**, et al. "*MyoAssist 0.1: MyoSuite for Dexterity and Agility in Bionic Humans*", ICORR 2025 Conference Paper
5. Rohan Walia, Morgane Billot, Kevin Garzon-Aguirre, Swathika Subramanian, **Huiyi Wang**, et al. "*MyoBack: A Musculoskeletal Model of the Human Back with Integrated Exoskeleton*", ICORR 2025 Conference Paper
6. Vittorio Caggiano, Guillaume Durandau, **HUIYI WANG**, et al. *"MyoChallenge 2023: Towards Human-Level Dexterity and Agility"*, NeurIPS 2024 Track Datasets and Benchmarks.
7. Vittorio Caggiano, Guillaume Durandau, Seungmoon Song, Chun Kwang Tan, **Huiyi Wang** et al., *"MyoChallenge 2024: Physiological Dexterity and Agility in Bionic Humans"*, NeurIPS 2024 Competition Track. https://openreview.net/forum?id=2vkf3Wkw2v

TALKS AND PRESENTATION

1. **"A Reinforcement Learning Approach for Assessing Standing Balance in Sarcopenia"***, Canadian Society of Biomechanics (CSB), *Oral Presentation*, 20th Aug 2024.
2. **"MyoSuite/MyoChallenge: Towards Full-Scale Human Embodied Intelligence",** *Guest Lecture,* The Theoretical & Computational Neuroscience Journal Club, Johns Hopkins University, 11th Sep 2024
3. **"Ariel Mission Target: A New Design for Phase Curve Observation"** Trottier Space Institute, McGill University Cowan Group Conference, 9th Aug 2023
4. **"Constraining the Earth Formation through Solar Nebular Imprints with Deep Mantle,"** Trottier Space Institute, Lee Research Group Meeting, 7th Dec 2022
5. **"CONSTRAINING THE HUBBLE CONSTANT: From the Tension Between PLANCK (CMB) and SHoES (SnIa) to the Cutting-Edge GW and FRB Detections,"** *Poster Presentation*, Trottier Space Institute, Bell Room, 6th Dec 2021
6. **"Gravitational Wave Signatures from Compact Object Binaries in the Galactic Center,"*** 52nd Annual DDA Meeting Virtual, 18th May 2021.

7. **"Gravitational Wave Signatures from Compact Object Binaries in the Galactic Center,"*** Gulf Coast Undergraduate Research Symposium, Physics and Astronomy Division, Rice University, 31 October 2020

(*) Accepted with a peer reviewed abstract.

AWARDS AND HONORS

1. **MEDA (McGill Engineering Doctoral Award)** - McGill Faculty of Engineering *2023 - 2025*
2. **GREAT Travel Reward** - McGill Faculty of Engineering *2024*
3. **Thomas and Penelope Deirdre Szirtes Fellowships in Engineering** - McGill *2024 – 2025*
4. **Geoff Hyland Fellowship -** McGill Faculty of Engineering *2023 - 2024*
5. **Grad Excellence Award in Physics** – McGill Physics Department *Sep 2021 – Sep 2023*
6. **Lee Grad Award** - McGill Physics Department *2021 – 2023*
7. **Trottier MSI Graduate Award** - McCall MacBain Scholarships, McGill University *2021 – 2023*
8. **College Honors Program** - UCLA College Honors *Spring 2020 – June 2021*
9. **UCLA Departmental Highest Honor** – UCLA Department of Physics and Astronomy *June 2021*
10. **UCLA Dean's Honor List** – UCLA College of Letter and Science *Fall 2017, Winter 2019, Winter 2020, Spring 2020, Fall 2020, Winter 2021*

OUTREACH

1. **MyoChallenge Advocacy** - MyoSuite *June 2024 - Present*
   Description: Led a 40-member advocacy group to organize workshops, tutorials, and talks for MyoChallenge 24' (competition hosted at NeurIPS) participants.
2. **Pen Pal Program -** Letters to a Pre-Scientist *Sep 2023 - Aug 2024*
   Description: Engaged with minority students in suburban areas in the US, fostering their interest in STEM professions by exchanging letters that introduced them to my own profession and experiences.
3. **AstroMcGill Space Fair Volunteer -** McGill Outreach *May 2023*
   Description: Presented explanations on space and ground telescope design to primary students during Science Day and guided them in the hands-on construction of their own telescopes using LEGO.
4. **Physics Matter Society** – Volunteer at Trottier Space Institute *Oct 2021 - Aug 2023*
   Description: Contributed to an outreach organization's mission to popularize and demystify physics for the general public.
5. **Space Explorer** – Volunteer to teach at Montreal Elementary Schools *Oct 2021 – Oct 2022*
   Description: Designed and implemented physics course modules and labs tailored to elementary students, fostering their interest in science.
6. **McGill Physics Hackathon -** Mentor Undergraduate/CEGEPs Student *Nov 2022*
   Description: Guided and mentored students participating in Hackathon by providing expertise in physics and coding to assist them in problem-solving and project development.
7. **AstroMcGill** – Volunteer at McGill Bicentennial Space Week *May 2022*
   Description: Presented the Trottier Space Program and shared insights from my own research at the Physics booth during the exhibition.
8. **Explore Your Universe** – Volunteer at Undergraduate Astronomical Society *Nov 2019, 2020*
   Description: Introduced the concepts of Dark Matter and Stellar Clusters to the public attending the event, promoting understanding and interest in astronomy and astrophysics.