

Cheng-Hao (Howard), Kao



About me

A second-year MASc student in Mechatronics engineering at the University of Waterloo. Proficient in machine learning and data analysis. Possess the analytical abilities required for research and design as well as a comprehensive grasp of engineering principles. Currently researching on multi-agent system workloads as an intern at Huawei, and working in the Structural Biomechanics Lab on ML-based injury prediction. Previously involved in the Robotics and Computer Vision Lab conducting research on multi-robot collaboration joint trajectory planning and control systems and in the Microelectromechanical Systems Lab dedicated to integration of FPCB mirror-based scanners. Seeking more professional training for further development within the field of AI, data analysis, and cognitive science.

Contact

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- Cheng-Hao Kao
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Languages

Chinese - Native Language
English - Professional Knowledge

Education

January
2024 -
Present

MASc in Mechanical and Mechatronics Engineering Waterloo, On, Canada
University of Waterloo
GPA: 3.90/4.0 Cumulative

Relevant Coursework: Introduction to Machine Learning, Pattern Recognition and Machine Learning, Deployment of Deep Learning Model, Computational Intelligence, Optimization Methods, Human Factors in Testing

August 2018
- June 2023

Bachelor of Engineering Toronto, On, Canada
Toronto Metropolitan University
GPA: 3.85/4.33 Cumulative

Relevant Coursework: Mechanical Design, Control of Robotic Manipulators, Real-Time Computer Control Systems, Fundamentals of Robotics, Mechatronics Systems Design, Measurements, Sensors and Instruments, Microprocessor Systems, Control Systems Digital Systems, Computer Programming Fundamentals, Electric Machines and Actuators, Electric Circuits, Applied Finite Elements, Vibrations, Machine Design, Mechanics of Machines, Solid Mechanics, Statics and Mechanics of Materials, Dynamics, Introduction to Engineering Design, Engineering Graphical Communication, Numerical Analysis, Linear Algebra, Differential Equations and Vector Calculus, Calculus II, Calculus I

August 2015
- June 2018

High School Diploma Shanghai, China
No.2 High School of East China Normal University
Average: 95.3/100

Work Experience

August 2025
- Present

Technology Planning and Cooperation Research Intern Waterloo, On, Canada
Huawei Canada

- Multi-agent system analysis
- Agentic science analysis
- AI4Research analysis and development

May 2024 -
April 2024

Teaching Assistant Waterloo, On, Canada
University of Waterloo

- Teaching Circuits
- Teaching Mechanics of Deformable Solids
- Teaching Statics

June 2023 -
January
2024

Research Assistant Toronto, On, Canada
Toronto Metropolitan University RCVL Lab

- Research on multi-robot collaboration joint trajectory planning and control
- Research on micro-plastic detection via ultrasonic sensor and machine learning

Professional Skills

Deep Learning Machine Learning
 Data Analysis Optimization
 Signal Processing Robotics Control Systems
 Microcontrollers Simulation and Design
 Engineering Mathematics

Honors and Awards

Dean's List 2018 to 2019 Dean's List 2019 to 2020
 Dean's List 2020 to 2021 Dean's List 2021 to 2022
 Dean's List 2022 to 2023
 Mechatronics Engineering Alumni Award
 Mechatronics Engineering Capstone Project Award
 Graduation with Distinction

Soft Skills and Strengths

Adaptability Problem Solving Collaboration
 Team Working Open-Mindedness
 Critical Thinking Communication
 Willingness to Learn Responsibility Reliability
 Enthusiasm Autonomy Motivated
 Stress Tolerance Research and Analysing
 Personal Time Management Strategic Planning
 Patience Empathy Discipline

Interests

- Deep Learning
- Machine Learning
- Cognitive Science
- Agentive Systems
- Control Systems
- Robotics
- Auto Chess
- Cats
- Bees
- Board Games
- Billiards
- Squash

September 2022 -
February 2023

Research Assistant

📍 Toronto, On, Canada

Toronto Metropolitan University MEMS Lab

- Research on FPCB mirror-based lidar scanners
- Integration of PSD sensors, ToF sensors, and GUI

April 2021 -
September 2021

Research Assistant Intern

📍 Toronto, On, Canada

Toronto Metropolitan University Ultrashort Laser Nanomanufacturing Lab

- Conducting porosity and fiber analyses via SEM image processing
- Generating molecular dynamics simulations

April 2020 -
September 2020

Research Assistant Intern

📍 Toronto, On, Canada

Toronto Metropolitan University Ultrashort Laser Nanomanufacturing Lab

- Conducting porosity and fiber analyses via SEM image processing
- Generating molecular dynamics simulations

Publications

Manuscript
2025

Predicting the Risk of ACL Injuries Using Machine Learning Models and Tibial Anatomical Predictors, *KSSTA*, [Link](#)

Arxiv Preprint
2024

Morphological Detection and Classification of Microplastics and Nanoplastics Emerged from Consumer Products by Deep Learning, *IEEE*, [Link](#)

Journal Article
2023

MR. CAP: Multi-Robot Joint Control and Planning for Object Transport, *IEEE Control System Letters*, [Link](#)

</> Other Projects

- Time-series signal classification for tool and firearm use intervention via deep learning (Honda, GRYP Tech & UW)
- Data cleaning of wearable sensor time-series data (Honda, GRYP Tech & UW)
- IMU data processing and visualization (GRYP Tech & UW)
- Object segmentation and identification via SAM and YOLO (UW)
- Analyzing effect of homogeneous bagging on small medical datasets (UW)
- EKF design for 3D object tracking (UW)
- Improving SVM prediction accuracy on minority classes for imbalanced datasets (UW)
- MPC implementation for path planning and controls (TMU)
- Inverted pendulum control via PID controllers (TMU)

Software Skills

Data Analysis

PyTorch

TensorFlow

AutoGluon

TabNet

SkLearn

YOLO

SAM

CATBoost

XGBoost

Optuna

NLOpt

Robotics

GTSAM

Modeling and Simulation

Simulink

MATLAB

ANSYS

Multisim