Jaehah Shin

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Education

BASc: University of Toronto, Engineering Science — Sep 2022 - 2026 + PEY (co-op)

- **Major**: Robotics Engineering

Dogwood Diploma: Yale Secondary School — Sep 2018 - June 2022

Experience

aUToronto ,
Simulation Team Member — Toronto, Ontario, Canada — Mar 2025 – Present

- Redesigning and implementing a custom vehicle dynamics model in Simulink to replace the built-in Vehicle Body 3DOF block, using a single-track (bicycle model) approach to simulate longitudinal, lateral, and yaw motion

Ted Rogers Centre for Heart Research – Franklin Research Lab,
Undergraduate Researcher — Toronto, Ontario, Canada — May 2023 - Present

- **Project 1:** Engineered a PID controller to maintain a precise 42 °C temperature over a defined period—effectively inducing cutaneous hyperemia—and designed a flexible PCB to integrate the heater seamlessly into a wearable form factor.
- **Project 2:** Conducted datasheet evaluations on roughly 100 SoC candidates, consolidating their key specifications into a Google Sheet; to streamline sensor selection and integration; developed and refined device drivers in a Zephyr-based RTOS to enable robust SPI communication and configuration between a Maxim Integrated chip and the chosen microcontroller.
- **Project 3:** Partnered with another undergraduate researcher to merge analog front-end and microcontroller PCBs into a single, compact, reusable board leveraging the MAX86178 AFE (ECG, PPG, BioZ/GSR); managed cross-functional coordination—updating meeting notes, preparing slide decks, and tracking development milestones—and contributed to the conceptual planning of an ultra-miniaturized ring-form wearable device based on this compact PCB design.

UTwind,
Aerodynamics Subsystem Member — Toronto, Ontario, Canada — Feb 2023 – May 2023

- Using qBlade software to optimize the shape of the blade.
- Making part of the turbine based on the programming and calculations.
- Worked for the International Small Wind Turbine Contest.

UTQC (University of Toronto Quantum Computing),
Q - News Contributor — Toronto, Ontario, Canada — Jan 2023 – May 2023

- Writing q-news (Quantum News), as editors on LaTeX.
- Find a research paper that is related to quantum computing that I found interesting to share with people. Q-News

UTKESA (University of Toronto Korean Engineering Students' Association) ,
Executive of Marketing (2022) & Academic (2023) | Director of Academic (2024) — Toronto, Ontario, Canada
Sep 2022 – May 2025

- Provided guidance and advice to first-year students on academic matters, including study strategies, and university resources.
- Organized and facilitated PEY (Co-op) Seminar: Coordinated seminars to prepare students for PEY opportunities, offering insights into industry expectations and application processes.
- Organized and facilitated Tutorial Sessions: Conducted tutorial sessions before midterms to assist first-year students in understanding course material and preparing for exams effectively.

Raum Hangul,
Co-Founder — Sep 2020 – May 2025

- Co-founded a Korean volunteer foundation during the pandemic with peers
- Conducting Korean language programs for children via Zoom
- Recruiting and supervising high school volunteers for teaching roles
- Oversee all students, teachers, and programs

Projects

Continuous all-day Wearable ECG Signal Acquisition Device under UofT Wearable — Sep. 2024 - Present

- Design and optimize device drivers for MAX30001G and nRF52840 microcontroller in Zephyr RTOS for ECG data collection via electrodes, using SPI and Bluetooth Low Energy for data transmission.

Turtle-bot 3 Waffle Pi robot Deliver Mail to Arbitrarily Chosen Stations — Sep. 2024 - Dec. 2024

- Developed a ROS-based TurtleBot 3 for randomized mail delivery to three offices using PID control and computer vision for precise line following on a circular route, and integrated Bayesian localization with an extended Kalman filter under Markov assumptions to ensure robust state estimation despite sensor noise.

Hug Bot — Jan. 2024 - Present

- HugBot uses facial emotion recognition to comfort humans. When sensing sadness or anger, it mirrors their expression, offering hugs until they feel better. Upon detecting happiness, HugBot celebrates by spinning its propeller hat. It maintains eye contact and blinks for a natural interaction. Hug Bot
- Used *tensorflow*, *Python* and *Arduino*

ESC 204 (Praxis III) - Smart Bin (PlastiSorter Bin) — Jan 2024 - April 2024

- Create a bin that can sort recyclable plastics into seven categories. This project aims to transform plastic waste management in urban areas of Ghana by introducing automation and a rewards system.
- Focused on enhancing recycling efficiency, improving segregation accuracy, and fostering community involvement
- Utilized *C*, *C++*, *Python*, and Arduino for project development.

Scholarships

Youth Leadership Scholarship: Issued by Milal Church in 2022

Joseph Chung Scholarship: Issued by Coram Deo Foundation in 2022 & 2023 & 2024 & 2025

Skills

Embedded System: Embedded System: Zephyr RTOS, NRF Connect SDK, UART, I2C, SPI

Hardware Design: SuperSpice, Eagle & Autodesk Fusion 360 (PCB), FPGA, Oscilloscope, Micro-soldering

Programming: C, Python, Assembly, LaTeX, MATLAB

Framework & Software: ROS, LabVIEW, Git, ModelSim

Language: Korean, English, Chinese

- Certification in Korean Proficiency Test [Highest Level]
- Chinese Character Certificate (Pre-level 4) [on a scale where 1 is the highest and 8 is the lowest level]
- HSK [Chinese Proficiency Test]