



# Junyeong Heo

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## Education

### City University of Hong Kong

B. E. in Computer and Data Engineering, Department of Electrical Engineering

Hong Kong SAR

September 2019 - June 2025

*Coursework: Cloud Computing Systems, Database Systems, Big Data, and Human-Computer Interaction*

### Vanderbilt University

Nashville, TN, USA

Study abroad coursework in the School of Engineering

January 2024 - May 2024

*Coursework: Applied Machine Learning, Artificial Intelligence, FPGA Design, and Programming Languages*

## Technical Skills

**Programming Languages** Python, JavaScript/TypeScript, C/C++, Rust

**Frameworks and Tools**  
**Frontend/Mobile:** React, Next.js, React Native, GraphQL  
**Cloud/DevOps:** AWS, Docker, Git, CI/CD (GitHub Actions)  
**Data/ML:** PostgreSQL, PyTorch, Scikit-Learn, SciPy, OpenCV

## Professional Experience

### MotoNerv Limited

Hong Kong SAR

*Hardware (Embedded Systems) Engineering Intern*

June 2023 - August 2023

- Developed a prototype of an MCU-based (ESP32) dashcam for streaming video and collected sensor data
- Preprocessed on-car sensor and location data tailored for AI video analytics in the AWS cloud environment
- Implemented data pipeline to stream sensor and video data directly to AWS S3 buckets for further processing via cellular network connection

### Elite Prep Academy

Busan, Republic of Korea

*Academy Assistant*

January - May 2022

- Managed the academy's weekly instruction plan
- Arranged academy operation and instruction schedule

## Projects

### Squash Motion Tracking (Final Year Project)



*Participated in Hong Kong Sport Institute (HKSI) initiated computer vision project for athlete performance analysis*

- Developed a full-stack computer vision and deep learning model-based tracking player pose detection pipelining system from match videos with a backend with FastAPI
- Integrated a processing pipeline, including video processing and orchestration of ML models (SAM2 and YOLO) via REST API to the backend
- Reduced the usage of VRAM during the segmentation process, optimizing the forward/backward propagation of frames to the transformer
- Containerized the system using Docker and Docker-Compose, enabling reproducible and portable deployment with support for NVIDIA GPU acceleration for optimal model performance

### Avatar community application



- Developed a React Native social media app with tab-based navigation and social feed using Expo and TypeScript
- Implemented user authentication, post creation, and social interactions (likes, comments, voting) with form validation using React Hook Form and Zod schemas
- Integrated with NestJS backend API using TanStack Query for state management and real-time data synchronization
- Built responsive UI components with Expo Router for navigation and React Native Toast Message for user notifications

### Hand tracking-based control interface



- Engineered Human-Computer Interaction system using OpenCV and computer vision framework, *mediapipe*
- Designed intuitive navigation to enhance the usability of devices from a distance

## *Leadership Activities & Other Experiences*

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**Student Resident (Senior Resident Tutor)**

July 2024 - July 2025

**Student Resident Cabinet (General Officer)**

October 2022 - May 2023

**Military service**

August 2020 - February 2022

**Private Tutoring**

- International Baccalaureate (IB) Diploma Programme (DP) - Mathematics
- Electrical Engineering

**Language:** Korean (Native), and English (Proficient)