

# 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

Study abroad coursework in the School of Engineering

Nashville, TN, USA

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, Unit Integration · **E2E Testing**

**Backend and Database:** NestJS, FastAPI, PostgreSQL

**DevOps & Infrastructure:** Git, CI/CD (GitHub Actions), AWS, Docker

## 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

## Projects

### RunFit



Running crew matching platform with location-based filtering and pace-based discovery

- Designed domain-based REST API structure where request/response bodies are typed subsets of core domain models, ensuring consistency across iterative requirement changes
- Bridged frontend planning with backend implementation by establishing flexible DTO patterns that accommodate evolving product requirements
- Architected Next.js proxy layer for all API requests to centralize request/response control, preventing backend endpoint exposure and mitigating security vulnerabilities in JWT-based authentication flow
- Implemented JWT authentication with httpOnly cookies and role-based access control (RBAC), addressing server/client component authentication in Next.js App Router environment
- Integrated TanStack Query with custom factory patterns for queries/mutations and structured error handling strategy across data fetching layers

### Squash Motion Tracking (Final Year Project)



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

- Architected a full-stack computer vision pipeline using FastAPI to track player movements and detect poses from match videos, enabling data-driven coaching insights
- Integrated a processing pipeline, including video processing and orchestration of ML models (SAM2 and YOLO) via REST API to the backend
- Optimized memory usage by implementing frame sampling for transformer-based segmentation, reducing VRAM consumption during forward/backward propagation
- 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

*cross-platform mobile social networking application for community interaction*

- Built a social media app using React Native with Expo, featuring tab-based navigation and interactive social feeds
- Implemented user authentication, post creation, and social interactions with type-safe form validation using React Hook Form and Zod schemas
- Integrated NestJS backend API using TanStack Query for state management and real-time data synchronization
- Developed cross-platform UI with push notifications and multi-language support (i18n) for enhanced user engagement

## *Leadership Activities & Other Experiences*

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### Frontend Short-Term Intensive Course - codeit

November 2025 - January 2026

- Completed 10-week intensive program covering modern frontend development practices including Jest/React Testing Library, CI/CD pipelines, and Next.js architecture patterns
- Established team development workflows by defining code conventions, PR templates, and collaborative review processes for a 4-person team project
- Led technical architecture decisions for API structure, authentication flows, and state management patterns in a production-grade running crew platform

### Data Science Coaching Study: 2024 - boostcourse

July - August 2024

- Completed 4-week program on Python data analysis covering pandas, numpy, and data visualization libraries (matplotlib, seaborn, plotly)
- Practiced exploratory data analysis techniques including correlation analysis, pivot tables, and statistical visualization on real-world datasets from KOSIS (Korean Statistical Information Service)

### 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