Junyoung Han

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Summary — Robotics + Software Engineer with experience developing novel solutions for the perception, planning, kinematics and control problems faced by autonomous systems in both academia and industry.

Experience

Founding Engineer - Kortex **May 2024 - Present**
- Founding Engineeer and Backend Lead for Kortex, a second brain + note-taking application
- Worked in a **Django** + **Postgres** + **Redis** backend to reduce response times by 80%, implement resource sharing, build a notifications system, and integrate with Stripe to enforce usage quotas
- Architected an **offline-first data pipeline** for native file-synchronization with conflict resolution built-in
- Built **context-aware AI Chat** using self-hosted chunking + embedding + retrieval pipeline, LLM tool calling, and communication via **websocket** + HTTP streaming
- Created and deployed **microservices** for import pipelines, user content parsing, LLM embeddings generation, feature flagging, resource locking and more using **NodeJS**, **Bun**, **Celery** and **Rocket.rs**
- Managed automated deployment using **AWS (EC2, S3, RDBS)** using **Terraform**, **Kubernetes** and **Jenkins**
- Set up monitors using **DataDog**, **Grafana**, and **Sentry** with **PagerDuty** integrations; was part of on-call rotation
- Helped grow app from a closed beta testing of 500 users to **$1 million ARR and 70 thousand unique users**

Software Engineer - Engineering Design Lab **May 2023 - Apr 2024**
- **Algorithms + Full Stack + Firmware Engineer** for EDL's five-axis 3D Printer
- Researched, proposed, and implemented novel **3D printer slicing algorithms** for non-planar geometries; achieved printing of spherical shells + infill, listed as named inventor on patent
- Built **native slicer application** using **Rust egui** with STL rendering and print plating capabilities
- Ported native app to web using **Rust-compiled WASM** of the native GUI and **Flask + Postgres + S3** Backend
- Developed custom **firmware stack in Rust/C/C++** for calibration, inverse-kinematics, motion planning + control; interfaces implemented with **UART**, **SPI** and **I2C**

Research

Continuum Robotics Laboratory **Sep 2024 - May 2025**
- Conducted **Undergraduate Thesis** research at the Continuum Robotics Laboratory at UofT
- Developed the first **open-source Python library** for forward/inverse kinematics of Continuum Robots by implementing Robot abstractions and state-of-the-art **inverse kinematics solvers**
- Benchmarked + Compared the implemented solvers by evaluating them across a novel dataset generated in-house

AuToronto Design Team **Jan 2023 - Aug 2023**
- Path planning developer at UofT's **Autonomous Driving team**; placed second at GM/SAE AutoDrive Challenge
- Built out global + local planning simulation for planning stack using ROS and PyGUI, improving iteration speed
- Improved memory usage by implementing dynamically allocated + updated world map

Education

University of Toronto - Bachelor of Applied Science and Engineering **2020 - 2026**
Major in Engineering Science, Robotics
- 3.6/4.0 CGPA, **5x Dean's Honour's list**
- **Awards:** *Faculty of Applied Science & Engineering Award*, *RBC Innovation Challenge winner*
- **Coursework**: Mobile Robotics and Perception, Linear Control Theory, Robotics Capstone, Robot Modeling and Control, Scientific Computing, Systems Software, Applied Fundamentals of Deep Learning, and more

Skills

Languages: Python, Rust, C, C++, MATLAB, JavaScript, TypeScript, HTML
Tools/Technologies: ROS2, PyTorch, Simulink, LaTex, Docker, Linux, Bash
Frameworks: Django, Flask, FastAPI, React, Node, Bun, Postgres, Mongo, Redis
Hobbies: Climbing rocks, changing (breaking) my nvim config, making mediocre coffee, singing badly at karaoke