

JUNWOO HWANG

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SUMMARY

I have been part of the co-founding team for [R2Home](#), a drone startup based in Switzerland aiming to improve weather forecasting with a reusable radiosonde glider platform flying back from the stratosphere (25km).

I am incredibly excited to apply for the Masters position to start in 2024, to meet and learn from so many smart individuals, and to dream something even bigger than what I have ever imagined!

Nationality: Republic of Korea **Languages:** English (Bilingual), German (B1), French (A1), Korean (Native)

EDUCATION

Invited Visiting Student, Bachelor Thesis (Grade: 5.5 / 6.0) November 2022 - March 2023
Autonomous Systems Lab, **ETH Zurich**

- Conducted research on Unified Path-Following Guidance for Hybrid VTOLS
- Supervisors: [Jaeyoung Lim](#), [Florian Achermann](#), [Roland Siegwart](#)

Exchange student, BA' Informatics & MA' Robotics March - June 2021
University of Zurich & ETH Zurich (Zurich, Switzerland)

- First year member of [Swissloop Tunneling](#) for Elon Musk's Tunneling competition. Sourced a Wheel Encoder, organized team events, and helped with software testing
- Took Autonomous Mobile Robots & Recursive Estimation Master courses at ETH Zurich

B.S.E, Electrical Engineering March 2019 - June 2023 (Incomplete)
Korea University (Seoul, South Korea)

- Coursework: Control Theory, Operating System, RF Engineering, Electronics, Engineering Mathematics, etc.
- Non-major courses: Entrepreneurship, Classical Music, Hispanic Cultures, and German
- Founded a Rocketry team as an Electrical lead. Competed in a National rocketry competition ('19)
- Founded a Hydrofoil-based marine transportation system team (WJPL). **Raised \$4500 in funding** ('20)

Science High School Diploma (Physics & Computer Science) March 2016 - February 2019
Daegu Science High School for Gifted Students (Daegu, South Korea)

- **Early-selected (Top 25%)** into the one of 10 prestigious & competitive (**Selection rate 5%**) research-focused science high-school for gifted students
- Coursework: Calculus, Linear Algebra, Data structure, Algorithm, etc. (University level)
- Self-taught: Orbital Mechanics, Rocket Engine Design, Mechanics of Materials, Embedded programming
- Conducted numerous researches, in total 3 for in-curriculum, and 4 for extra-curricular programs

RESEARCH

Unified Path-Following Guidance for Hybrid VTOLS ([Github](#)) November 2022 - March 2023 (15 weeks)
Investigated feasibility of having unified path following guidance for multicopter and fixed wing

- Extended the non-zero nominal speed constraint of a Non-Linear-Path-Following algorithm for Fixed Wing vehicle to a Multicopter use case
- Implemented algorithm & conducted simulation in OpenAI Gym environment to evaluate path following efficiency

Development of a High-Altitude Long-Endurance Solar Airplane ([Blog](#)) January - December 2017
Conducted research & development on a 5-meter wingspan solar airplane for flying perpetually during summer

- Conducted literature review on [Atlantik Solar](#), a world record-breaking solar airplane from ETH Zurich & contributed bug fixes to their open-source Solar Plane Optimization program
- Manufactured all parts from scratch, using Carbon Fiber lamination, Laser Cutting, wiring Solar Panels in 3 months

Self-returning Glider Radiosonde ([Blog](#)) May - September 2016
Conducted preliminary design & research on creating a reusable radiosonde

- Programmed and built a flying wing configuration airplane with weather sensor to test the guidance law
- Conducted literature review on the feasibility of creating a reusable radiosonde system

WORK EXPERIENCE

PABLO AIR (Daejeon, South Korea) | PX4 Flight Control Software Consultant November 2023 - Present

- Troubleshooting the internal issues as a PX4 Flight Control Software specialist
- Resolving unstable takeoff behavior on inclined surfaces, Arming on unstable environments, etc.

R2Home (Lausanne, Switzerland) | Co-founder, Fixed Wing R&D Lead January 2023 - Present

- Developed and tested a low-cost Fixed-wing platform to replace single-use radiosondes (core business model)
- **Won Innovation Booster Robotics (25,000 CHF) grant with MeteoSwiss** as partner ('23)

Dronecode Foundation (Remote) | Release Coordinator Feb - Aug 2023 (6 months)

- Coordinating the release cycle of the [PX4-Autopilot](#), gathering user reports, testing and development
- Re-structured weekly calls for developers, created documentation and release notes for v1.14

Auterion (Zurich, Switzerland) | PX4 Flight Control Software Intern February - November 2022 (9 months)

- Re-wrote the improved Follow-Me mode. Presented at **PX4 Dev Summit 2022 in Austin, Texas** ([Presentation](#))
- Created [PX4 Explained](#) Series with 6 articles explaining important concepts of PX4 Autopilot

UVify (Seoul, South Korea) | Aerial Robotics Intern February - August 2020 (6 months)

- Programmed a YOLO v3 network (w/ 80% accuracy) for Helipad detection (**won 2nd place in UAV Challenge**)
- Created an indoor swarm drone test environment using PX4 and Motion Capture system

PROJECTS

Autonomous RC Paramotor ([Blog](#)) January - March 2023

Fitted a Pixhawk on an RC Paramotor (wingspan 1.5m) and achieved autonomous mission flights

"Before They Change The World" Podcast ([Website](#)) March 2022 - Present

Created a Podcast to interview student teams with big potentials, published 17 episodes

- Interviewed several Focus Project leads from ETH Zurich, including [AITHON](#) and [PERIPHAS](#)
- Collaborated with Student Project House (Makerspace), got featured on ETH Zurich Instagram Account

Rocket Thrust Measurement System ([Blog](#)) May - July 2019

Created a Rocket Engine Thrust measurement system to qualify rocket team's motor

- Designed and constructed the electronics & software part of the Thrust Measurement System
- Worked with high pressure pipe, valve systems, and mechanical coupling to rocket motor

Electric Skateboard & Remote Controller ([Blog](#)) Jan 2017 - Sep 2018

Built long-range (50km) e-skateboard and wireless controller from scratch, and rode for more than 200km

- Designed custom PCB & Wrote software for the remote controller with bi-directional telemetry
- Handcrafted the board, spot-welded the battery pack from 18650 cells, fabricated carbon fiber casing

Cafeteria Congestion monitoring system ([Blog](#)) Mar - Dec 2016

Built & field-tested cafeteria waiting time monitoring system, provided service for 300 students & 100 teachers

- Designed circuitry and software to monitor and display waiting time predictions in a school cafeteria
- Won **1st place (by prime minister of education)** in national cafeteria idea competition

OTHER

Soft Skills: Extroverted, Outgoing, Friendly, Motivated

Paragliding Pilot License: SHV-FSVL (Swiss Paragliding Association), 2023

Hobbies: Alpine Climbing, Paragliding, Guitar, Video production ([YouTube Channel](#)), RC Model Flying

Programming: PX4-Autopilot (Flight Control Software), Git, Python, C, C++, AVR, ROS, Qt, Docker