Taeyoon Kim

(+82)10-3633-8738 | dbsl0512@naver.com

Education & Work experiences

Kwangwoon University Seoul, South Korea

B.S student in Electronics and Communication Engineering Mar. 2019 ~ Feb. 2023

- Major GPA of 3.61 / 4.5

Undergraduate Research Assistant (Co-operation with S.O.X) Mar. 2021 ~ Jul. 2022

- Estimation of Signal Strength Distribution Based on GPR(Gaussian Process Regression) for Improving the Precision of Fingerprint.
- Development of GPS, LTE signal receiving board, and signal processing SW for Raspberry Pi installation.
- Development of GPS, LTE, WIFI and BLE signal receiving Application.
- Development of WIFI Tag and Tag connection Application.

Perigee Aerospace Daejeon, South Korea

Engineer, Flight Control team (Dynamics & Control) Feb. 2023 ~ Present

Research Interest

Approximation and Optimization

KF, Sensor fusion, Localization, Vision aided navigation, Gaussian process, RL

Image Processing

Filtering, Image Segmentation, Feature extraction, Registration, Alignment, Clustering

Control Engineering

Control system design, Modern control theory, Guidance

Embedded System

Circuit design, PCB artwork, Firmware programming

Project Experience

Automatic Drone Flight Control System for Disaster Monitoring and Crime Prevention. Jan. 2020 ~ Jun. 2021

MATLAB Simulink, IMU, EKF, PID Control, Path tracking, Object Detection, Optical Flow data, Sensor fusion

Urban Unmanned Transportation Robot for Optimization of Logistics System. Jun. 2021 ~ Nov. 2021

GPS, 2D Lidar, Fingerprint, SLAM, Navigation, ROS, Sensor fusion

Development of the Equatorial Mount for the Automation of Astronomical Observations. Mar. 2020 ~

Circuit Design, PCB Fabrication, STM32 Firmware, CAD

HDPE and N2O based Hybrid model rocket Design and Flight stabilization. Mar. 2022 ~ Sep. 2022

With Korea aerospace Univ., SpaceCAD, Combustion test, IMU, EKF, Aerodynamic, PID control

Vision SLAM Quadruped Robot Using Stereo Camera. Jan. 2022 ~ Nov. 2022

MATLAB Simulink, FOC control, Inverse Kinematics, ROS, SLAM

(For more information about project, please refer to the ‘Appendix – Project Experience’ Section)

(Perigee) Development of SDR-based FTS system Feb. 2023 ~ Apr. 2023

FPGA, SOC, USRP, RF

(Perigee) Development of Launch Vehicle's System integration inspection software Feb. 2023 ~

QT, C++, Python, multi-thread, high speed daq

(Perigee) Development and testing of Hover test vehicle based on Jet Engine Feb. 2023 ~ Jul. 2023

MATLAB Simulink, Raspberry pi, STM32 HAL, INSGPS, Classic Control

(Perigee) Development of Sub-orbital Launch Vehicle using upper-stage Engine Mar. 2023 ~

MATLAB Simulink, STM32 HAL, Aerodynamic, Control system analysis, HILS

Skills

Programming

C/C++, JAVA(Android), Python(skleam, Tensorflow, OpenCV)

Embedded Programming

Assembly(ARM), System Verilog, Arduino, STM32

Robotics & Control

ROS1(C++ & Python), MATLAB (Simulink)

CAD & Circuit Design

EasyEDA, Orcad(Virtuoso, Capture, Hspice, Pspice), Fusion360, Inventor

Honors & Awards

Awards

- Special Prize - 2020 Regional Adhesive Capstone Design, Nowon-gu Office (Jan. 2020)
- Top Prize - 2020 KW-Start-up Club Performance Report Contest, Kwangwoon University (Dec. 2020)
- Grand Prize - 2020 KW IR Investment Competition, Kwangwoon University (Dec. 2020)
- Excellence Prize - 2021 Winter General Academic Presentation 5G AI-based ICT Convergence Service Idea Contest, Korea Communications Association (Feb. 2021)
- Excellence Prize - 2021 1st Semester Chambit Design Semester Performance Presentation, Kwangwoon University (Jun. 2021)
- Grand Prize - 2021 KW-Startup Club Performance Report Contest, Kwangwoon University (Dec.2021)
- Grand Prize - 2021 KW IR Investment Competition, Kwangwoon University (Jan. 2022)
- Excellence Prize - 18th Kwangwoon ICT Work Exhibition (KWIX), Kwangwoon University (Sep. 2022)
- Bronze Prize - 2022 Hanium ICT Mentoring Contest, Korea Information Industry Association (Dec.2022)

Honors

- Academic Excellent Scholarship, Kwangwoon University (Fall. 2022)

Appendix - Project Experience

Automatic Drone Flight Control System for Disaster Monitoring and Crime Prevention. Jan. 2020 ~ Jun. 2021

MATLAB Simulink, IMU, EKF, PID Control, Path tracking, Object Detection, Optical Flow data, Sensor fusion

- Development of automatic control and control system for drones patrolling designated areas.
- Posture estimation through filtering of IMU sensors and posture control through PID controller.
- Position control via PID controller based on GPS.
- Improved position control accuracy at low altitude through optical flow sensor fusion.

- Flight stabilized and object recognition succeeded.
- Target object recognition is also successful due to stabilized in-flight posture.

Urban Unmanned Transportation Robot for Optimization of Logistics System. Jun. 2021 ~ Nov. 2021

GPS, 2D Lidar, Fingerprint, SLAM, Navigation, ROS, Sensor fusion.

- Development of a robot for delivery from the main gate to each door inside the apartment complex
- GPS outdoors, 2D Lidar indoors Navigation based on.
- Applying GPR fingerprint to improve indoor and outdoor GPS shading and accuracy in indoor and outdoor passageways.

Development of the Equatorial Mount for the Automation of Astronomical Observations. Mar. 2020 ~ Feb. 2022

Startup Club, Circuit Design, PCB Fabrication, STM32 Firmware, CAD

- Automate the process of finding and tracking celestial bodies in astronomical observations.
- Optimizes control without vibration for both ultra-low and high speed drives.
- To compensate for coordinate alignment errors, select a specific star and track pixel coordinates to calculate the vector of the error, resulting in a correction signal.
- Implement ISR to enable high-speed signal processing in firmware to implement time critical calibration.

HDPE and N2O based Hybrid model rocket Design and Flight stabilization. Mar. 2022 ~ Sep. 2022

With Korea aerospace Univ., SpaceCAD, Combustion test, IMU, EKF, Aerodynamic, PID control

- It is intended to directly implement posture control of projectiles flying at high speed.
- We designed and manufactured a rocket engine that uses HDPE and N2O as fuel, and conducted a combustion test.
- Perform aerodynamic analysis according to the receiving angle of the canard pin, calculate the required physical properties, and proceed with the simulation(including gain scheduling).
- Successful control within max overshoot 10deg in MATLAB simulation environment.
- Actual firing failed due to thrust weight ratio issue as a result of actual combustion test.
- Future plans to replace fuel with paraffin to challenge actual launch

Vision SLAM Quadruped Robot Using Stereo Camera. Jan. 2022 ~ Nov. 2022

MATLAB Simulink, FOC control, Inverse Kinematics, ROS, SLAM

- Design robot platform & Analysis of the Inverse Kinematics of the robot platform.
- Design trajectory of end effector for quadruped walking.
- Implementation of walking algorithm firmware
- Application of Navigation based on IMU & Vision SLAM through ROS.