

Shin
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CONTACT

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[https://github.com/
CarpEDIEM324](https://github.com/CarpEDIEM324)

LANGUAGES

Korean – Native
English – Business Level

OBJECTIVE

To leverage my expertise in C++, Python, and robotics to develop reliable and efficient software systems, thereby contributing to the advancement of autonomous driving and robotics.

WORK EXPERIENCE

01/2024 - 06/2024

Research Intern,
Korea Atomic Energy Research Institute (KAERI), Daejeon, Korea
Responsibilities:

- Built a data visualization panel for robot operations
- Used Isaac Sim to test and evaluate 3D SLAM open-source software
- Conducted extreme-environment experiments with a Unitree Go1 quadruped robot to improve SLAM performance

07/2022

Administrative Intern,
Yeosu City Hall, Yeosu, Korea
Responsibilities:

- Sorted and recorded incoming mail with attention to detail
- Assisted citizens with inquiries, providing polite and efficient support

EDUCATION

2018 - 2024

Bachelor Degree of Computer Science,
Korea University of Technology and Education (KOREATECH)

2015 - 2018

High School Diploma, Yecheon High School, Yeosu, Korea

Academic Awards / Achievements

- Grand Prize in the Unmanned Mobility Category at the 2023 University Creative Mobility Competition
(Awarded by the Ministry of Land, Infrastructure and Transport)
- Excellence Award in the Embedded Robotics Track at the Samsung Youth Software Academy (SSAFY)
(Recognized by Samsung Electronics)

ADDITIONAL SKILLS

Programming Languages: C++, Python, JavaScript
Web Technologies: HTML, CSS, Node.js
Robotics: ROS, ROS2

SAMSUNG SW ACADEMY FOR YOUTH(SSAFY)
Embedded Robot Track

PROJECTS

1) STUDENT CREATIVE MOBILITY COMPETITION 2023 Unmanned Mobility part

- Team Composition: 12
- Role: Localization Lead
- Duration: 03/2023 ~ 10/2024
- Details:
 - Vehicle position and heading estimation using RTK GPS and IMU
 - Conversion from WGS-84 coordinate system to UTM
 - Creation of Global Path using JOSM
 - Autonomous mission execution on the K-City track (avoiding static, small, and large obstacles, delivering in shaded areas, etc.)
- Video: https://www.youtube.com/live/g-u4luKR8nU?si=1tMJbcV1_7eGXljx&t=16490
- Article: <https://www.yna.co.kr/view/AKR20231017031600003>

2) Nanosaur Line Tracing

- Team Composition: 3
- Role: Motor Control & Line Detection
- Duration: 03/2023 ~ 06/2023
- Details:
 - Creation of a tracked Nanosaur vehicle using the Jetson Nano board
 - Line detection using OpenCV and conversion to HSV
 - Implementation of motor control algorithm and line following logic in C++
- GitHub: https://github.com/Carpediem324/nanosaur_robotprogramming

3) Web Panel for Space Exploration Rover

- Team Composition: 2
- Role: WebRTC & ROS Integration
- Duration: 01/2024 ~ 03/2024
- Details:
 - Implementation of a web panel to share the robot camera using WebRTC, with external deployment via Ngrok
 - Real-time visualization of ROS topics (e.g., motor RPM data) on the web panel using roslib.js

4) Indoor SLAM Evaluation in Extreme Environment

- Team Composition: 3
- Role: Network and SLAM Parameter Analysis
- Duration: 01/2024 ~ 06/2024
- Details:
 - Establishment of an internal network using OpenVPN
 - Measurement of Round-Trip Time (RTT) and estimation of Network Budget using Action Programming in both ROS1 and ROS2
 - Tuning and experiments with HDL Graph SLAM parameters
 - SLAM performance testing using NVIDIA Isaac Sim (PhysX Lidar, RTX Lidar)
 - Creation of corridor, circular, and rectangular maps using SolidWorks and performance evaluation in various environments
 - Indoor SLAM experiments and evaluations using the Unitree Go1 robot
 - Combination of 3D maps with radiation data and creation of 2D radiation maps using PyQtGraph

5) Mock Interview Website with STT

- Team Composition: 4
- Role: Backend & Prompt Engineering
- Duration: 09/2022 ~ 06/2023
- Details:
 - Setup and deployment of authentication and database using Firebase
 - Implementation of STT using webkitSpeechRecognition
 - Extraction of keywords and spell checking using npm packages (keyword-extractor-korean, hanspell)
 - Automatic generation of interview answers and follow-up questions using the OpenAI GPT API (Prompt Engineering)
- GitHub: https://github.com/toodox/kut_stt
- Web Link: <https://koreatechsttmockinterview.web.app>

6) RAG-based Chatbot Service

- Team Composition: 4
- Role: LangChain & Upstage RAG Pipeline
- Duration: 12/2024 ~ 12/2024
- Details:
 - Construction of a LangChain and Upstage RAG pipeline (using UpstageEmbeddings)
 - Extraction of keywords from user queries via LLM (Solar)
 - News search related to the query using the Naver News Search API (or Google SERP API when necessary)
 - Top-K similar document retrieval using Chroma DB
 - Generation of responses by feeding the extracted news articles back into the LLM (using a RAG structure)
- GitHub: <https://github.com/haerim-kweon/newchats>

7) Dobot Magician Project

- Team Composition: 2
- Role: ROS Programming & Digital Twin
- Duration: 10/2024 ~ 11/2024
- Details:
 - Control of Dobot in a ROS environment (via socket communication)
 - Transmission of joint angle data between RoboDK and Dobot (Sim to Real to Sim)
 - Panel recognition using Yolov8 → Socket communication via Raspberry Pi → Operation of conveyor belt & object classification
- GitHub: https://github.com/Carpediem324/ssafy_project

8) ROBOCOP (Unmanned Security Robot Control System)

- Team Composition: 6
- Role: Autonomous Driving Implementation in Simulation
- Duration: 01/2025 ~ 02/2025
- Details:
 - Transmission of robot data and reception of commands based on web socket communication
 - Remote web-based control of the robot
 - Creation of a Global map and publishing heading based on the robot's current location
 - 3D Lidar-based object detection and issuance of emergency stop commands upon obstacle detection
 - Global Path Planning based on the A* algorithm
 - Robot driving control based on Pure-Pursuit
 - Robot state control using custom Topic messages and Services

9) Home-based Intelligent Voice Assistant System: Distributed Voice Event Detection and AI Assistant Integration (in collaboration with Samsung Electronics' DA Division ~ing)

- Team Composition: 6
- Role: Embedded On-Device Keyword Recognition
- Duration: 02/2025 ~ 04/2025
- Details:
 - Establishment and operation of a Docker container environment based on Raspberry Pi 5 (Ubuntu 24.04)
 - Implementation of a wakeup keyword recognition module for real-time learning and processing of user voice commands
 - Transmission of voice data to the AP via MQTT protocol upon keyword recognition
 - Packaging into a Docker container for stable operation in various environments, with plans for future deployment on Docker Hub

Licenses & Certifications

1. Vocational Competency Development Instructor

Issuing Organization: Ministry of Employment and Labor

Registration Number: Teacher Level 3 - No. 96945

Acquisition Date: 2024.08.14

2. Information Processing Engineer

Issuing Organization: Human Resources Development Service of Korea

Registration Number: 24202060700U

Acquisition Date: 2024.09.10

3. Microsoft Certified: Azure AI Fundamentals (AI-900)

Issuing Organization: Microsoft

Registration Number: wdjjw-H9uh

Acquisition Date: 2023.12.06

4. Word Processor Level 2

Issuing Organization: Korea Chamber of Commerce and Industry

Registration Number: 11-I9-003537

Acquisition Date: 2011.01.28

5. Class 1 Driver's License

Issuing Organization: Jeonnam Provincial Police Agency

Registration Number: 18-18-600455-90

Acquisition Date: 2018.01.05
