Shin Hyeonhak

CONTACT

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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

Research Intern, 01/2024 - 06/2024
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

Administrative Intern, 07/2022
Yeosu City Hall, Yeosu, Korea
Responsibilities:

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

Iron Steel Making DX section 08/2025 ~
POSCO DX, Gwangyang, Korea

- Task in charge of digital transformation of POSCO.
- Currently in progress

EDUCATION

Bachelor Degree of Computer Science, 2018 - 2024
Korea University of Technology and Education (KOREATECH)

High School Diploma, Yeocheon High School, Yeosu, Korea 2015 - 2018

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 **(2nd Place)** in the Embedded Robotics Track at the SAMSUNG SW AI ACADEMY FOR YOUTH

• Excellence Award **(3rd Place)** in the Samsung Electronics DA Division – SSAFY Joint Project at the SAMSUNG SW AI ACADEMY FOR YOUTH

•Excellence Award **(1st Place)** in the Autonomous Project at the SAMSUNG SW AI ACADEMY FOR YOUTH

•**1st Place** in the Project Exhibition & Presentation Competition at the SAMSUNG SW AI ACADEMY FOR YOUTH

ADDITIONAL SKILLS

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

ACTIVITIES

07/2024 – 06/2025

SAMSUNG SW AI 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)

- 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