

SU-BIN KIM

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— WORK AND ACADEMIC RESEARCH EXPERIENCE

Work Experience

2023– Winter **Research Intern**, Intelligence and Interactive Robotics Lab, GNU, Jinju, Republic of Korea.

Academic Research Experience at GNU

2023–Winter **Intelligence and Interactive Robotics Lab**

○ Project: Ankle Mobility Assistance Robot Utilizing Reinforcement Learning

- Works: Initiated the concept and set up the environment for a robotic orthosis project ‘Designing and training a robotic orthosis controller using a human model integrated with bones and a skeletal structure within a computer simulation Environment (OpenSim +OpenSim-RL) and fine-tuning the motor's parameters in the robot using reinforcement learning (Proximal Policy Optimization Algorithm) to aid patients with impaired mobility.’

- Expected Result: Enhancing synchronization between the robot’s learning rate and the simulator environment (human gait learning) by introducing a two-step of low-pass filter and applying PPO Algorithm, which demonstrates superior performance compared to the Actor-Critic Algorithm

○ A Mobility Assistance Module for Visually Impaired Individuals

Designing total concept and hardware with Teensy 4.1 Boards, YDLIDAR X3 Arduino kits, digital Radar modules (TRM-121A), a speaker, and an ESP8266 Wi-Fi module.

2023–spring **Course Project:** machine learning /AI basic

○ Adapting and Enhancing the Reinforcement Learning Algorithm in the Atari Game and Cartpole using PPO (Proximal Policy Optimization Algorithm)

2023–spring **Senior Capstone Design Project**

○ Novel Concept of Liquid Level Sensor using Distributed Optical Fiber Sensor with High Spatial Resolution: Data Analysis with Python and others.

2022–2023 **Safe Search Lab**

○ Improvement Follow the Gap Method (FGM) for obstacle avoidance

- In the Linux environment, setting up the F1/10th model

- Parameter Tuning for F1 Tenth Autonomous Driving Education and Race

2021–2022 **Composite Structure Lab**

○ Fabrication of carbon fiber-reinforced polymers (CFRP) and performing a tensile measurement

— PEER – REVIEWED CONFERENCE PRESENTATION

Su-Bin Kim, Hyung-Rae Cho, Ji-Won Kim, Joo-Ho Lee, “F1Tenth Autonomous Driving Global Education and Race,” LINC 3.0 Capstone Design Conference in Suwon-si, Republic of Korea, 2022

[K1] Hye-Won Lim, Da-Hoon Jeong, **Su-Bin Kim**, Jun-Woo Park, Hyeon-Min Choi, Hyung-Mo Kim, “Supporting Structure for Level Sensor Using a Distributed Optical Fiber Sensor”, 2022 KCI Spring Symp., July. 2022.

— PATENTS

[KP1] **Su-Bin Kim**, Hyung-Mo Kim, Hye-Won Lim, Da-Hoon Jeong, Jun-Woo Park, Hyeon-Min Choi, “Novel Concept of Liquid Level Sensor using Distributed Optical Fiber Sensor with High Spatial Resolution”, Patent application, KR10-2023-0192798, Dec. 2023.

— INTERNATIONAL SEMINARS

GNU-UPenn Collaborative Academic Research Seminar Series: Participated international research exchange event at the University of Pennsylvania at Philadelphia

Billy, "Game-theoretic Racing", University of Pennsylvania, 2022.

Billy, "SLAM Hands-on", University of Pennsylvania, 2022.

Zhijun, "Planning hands-on", University of Pennsylvania, 2022.

Ahmad & Tomas, "Model-Predictive Control basics", University of Pennsylvania, 2022.

Zirui, "Computer Vision (Classic and Learning-based)", University of Pennsylvania, 2022.

Matthew O'Kelly, "Path Planning for High-dynamic overtaking maneuvers: The Graph-based Planner", Google, 2022.

— AWARDS AND HONORS

The 1st F1Tenth Korea Championship, 2022: Second Prize (Sonnet.ai Proprietor Award), KSMTE, Republic of Korea, 2022.

2022 GNU Creative Challenge Design-Based Idea Competition: Second Prize (College of Engineering Dean's Award), GNU, 2022.

Merit-based scholarships, GNU, 2021/2023 Spring, 2018/2022/2022 Fall.

— EDUCATION

2024– Summer **WASSUP AI Model Developer Bootcamp 2nd Cohort (Upcoming)**, EST soft, Republic of Korea.

2017–2023 **B.S., Gyeongsang National University (GNU)**, Jinju, Republic of Korea.
Discipline: Mechanical Engineering

— CS-RELATED COURSE WORKS

Courses: Introduction to Computer Programming Practice PBL (A0), Introduction to Computer Programming PBL (A0), Object Oriented Programming (A+), Data Structures (A0), Computer Architecture (A+), Autonomy Systems-Capstone Design (A+), machine learning /AI basic(A+), Computational analysis practice (A0), Discrete Mathematics (A+)

PROGRAMMING SKILLS

Programming Languages: Python, Kotlin, MATLAB

Software skills (Mechanical Tool): CATIA, COMSOL, Workbench

CUMULATIVE GPA AND CS COURSE GPA

Cumulative GPA: 3.52/4.5 (150credits),

CS Course GPA: 4.28/4.5