Minjun Chang

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Research Interests: *Robotics, Locomotion, Motion Planning, Marine, Reinforcement Learning, Connectivity*

Education

Yonsei University, Seoul, Republic of Korea   Mar 2019 – Feb 2025(Expected)
- **B.S., Mechanical Engineering** (GPA: 3.33/4.3)
- **Senior thesis:** Adaptive control with State-Estimator for Bipedal Locomotion

Selected Honors and Awards

1st place, National ICT Smart Device Competition, *Ministry of Science and ICT*   *Aug2024*

- Award ***by the Minister of Science and ICT***
- Led a team of 5 in developing an *Autonomous Manufacture Assistant* CARTRASCHE
- Designed a mobile robot with rotating shelf system using SLAM for navigation in ROS
- Implemented custom RC filter and encoder-less motor control algorithm for activation
- Operated based on: Linux OS, ROS1, Python and C++ [News, Project Page, Video]

1st place, 2022 Autonomous Driving Robot Racing Contest, *Korean Robotics Society*   *Nov 2022*

- Developed a control algorithm with ROS, utilizing LiDAR, IMU, and GPS for collision avoidance
- Implemented sensor fusion algorithm on ROS platform for localization
- Operated based on: Linux OS, ROS1, ROS2, Python and C/C++ [News, Contest Video]

Selection, Hanium Contest, *Federation of Korea Information Industries*   *Nov 2021*

- Led a team of 4 in developing *Personalized Digitial Content Literacy program EYE-TUNER*
- Implemented pupil tracking algorithm for the program [Project Page]

2nd place, Medical Hack 2021, *Busan City*   *Nov 2020*

- Implemented posture prediction algorithm with multiple load-cell sensors

2nd place, Yonsei IHEI Workstation, *Yonsei University*   *Jul 2020*

- Designed an autonomous urine analysis apparatus and its actuator system [Video]

3rd place, Yonsei/Nexon Creative Platform, *Yonsei RC-committee*   *Dec 2019*

- Designed a sound-reactive dimming lantern for outdoors tables to reduce noise pollution

Work Experiences

GOLE Robotics (Robotics Engineer, Path Planning & SLAM)   *Apr 2024 – Jun 2024*

- Implemented A* for global path planning and sMPC for local path planning on ROS2 and robot (WeRo)
- Developed actuator controller package with C++/Python binding

DRIMAES (Embedded Software Engineer, Research Engineer)   *Oct 2022 – Mar 2024*

- Linux, ARM MCU software/firmware programming,
- Developed various communication protocols (Serial, MQTT, REST, CAN)
- Implemented virtual container management system and integrated with robot system (HD Hyundai Robotics)

ToysMyth (Embedded Software Engineer, Research Engineer)   *Feb 2022 – Oct 2022*

- Developed embedded software for Mediatek, ESP chipsets,
- Enhanced custom OpenWRT OS kernel

Alsemy (AI Lab Intern, Intern)   *Jun 2021 – Aug 2021*

- Implemented prediction data smoothness verification metric

Publications and Conferences

Publication

1. Hyeongwoo Nam[1], Seoyeon Choi[1], **Minjun Chang[1]**, Joonho Yang[1], Jaehyeon Lim, Jongeun Choi*, "State prediction-based control input delay compensation for autonomous driving systems", *The 18th Korea Robotics Society Annual Conference (KRoC 2023, Feb. 15-18, 2023) [1]equal contribution,*
   - Oral presentation in a special session, "Autonomous Driving Robot Racing Technics"

2. Minjun Chang[1], Jaeyong Shin, Jaeheung Park*, "*Simultaneous Training of State-Estimator and Symmetry Configuration for Bipedal Locomotion*" [in preparation]

Research Experiences

Dynamic Robot System Laboratory, Seoul National University   *Jul 2024 – Present*
Undergraduate Intern. Supervisor: Prof. Jaeheung Park

- Reinforcement Learning based bipedal locomotion control with simultaneous state estimator training

Mechanobiology and Soft Materials Laboratory, Yonsei University   *Jul 2020 – Jun 2021*
Undergraduate Intern. Supervisor: Prof. Hyungseok Lee

- Developed Handheld Standing Surface Acoustic Wave Cell Alignment Device
- Proposed "bridged hold design" for SSAW cell alignment and simultaneous UV reactive angiogenesis

Biomedical and Energy System Laboratory, Yonsei University   *Dec 2019 – Feb 2020*
Undergraduate Intern. Supervisor: Prof. Wonhyung Ryu

- Designed cardiovascular micro stent structure

Selected Projects

Leafeon Cluster: Indoor Atmospheric Environment Observer, *Personal Project*   *Feb 2023 –Sep 2023*

- Developed an atmosphere observing device with remote data collecting server and visualizing dashboard
- Full stack solo project [github]
- Operated based on: ESP32WROOM, AWS RDB, Jekyll Frontend

Development of Fleet Management System for multi-robot cluster, *Hyundai Robotics*   *Sep 2023 – Dec 2023*

- Implemented task scheduling and allocation algorithm based on order status for multi-robot delivery network
- Operated based on: Linux OS, Python, Custom MQTT Protocol on Hyundai Robotics serving robots

FennecBot: Industrial Anomaly Detection Mobile Robot, *SM Instruments*   *Mar 2023 – Aug 2023*

- Developed multi-modal deep learning network for pipeline anomaly detection and the classification of pipeline leakage using RGB camera, and ultrasonic/acoustic sound camera
- Operated on Scout mini with line-tracing algorithm detecting pipe leakage within Hyundai HI. factory

SAJOGI: Boston Dynamics Spot Micro project, *RoboIn*   *May 2022 – Nov 2022*

- Buit a small scaled four-legged robot based on *Boston Dynamics SPOT* morphology
- [github]

Extracurricular Activities and Leadership

YAI, Artificial Intelligence Club, Yonsei University   *Mar 2022 – Present*
- Studied open courses and papers about robot learning and wrote review articles

RoboIn, Robotics Club, Yonsei University   *May 2020 – Present*

- Executive Staff (2020 - 2023), Vice President (2021), President (2021-2022)
- Robot Projects: quadruped robot (based on SPOT of Boston Dynamics), quadrotor drone, hexapod
- Conducted Seminars: basics of CNN, basics of reinforcement learning, serial communication

Patents and Copyrights

Patents

The Urine Examination Apparatus and Controlling Method of the Same   Nov 2023
(KR10-2020-0176792, under prosecution)

Autonomous Human Following Manufacture Assistant Robot   Aug 2024
(Korea, in preparation)

Software Copyrights

Eye Tuner: Media Literacy Program based on Pupil Tracking by Computer Vision   Nov 2021
(Korea Copyright Commission, C-2021-050308)

Skills Summary

Programming Languages: Python, C/C++, MATLAB

Frameworks/Tools: ROS, Docker, PyTorch, FastAPI, IsaacGym, AWS, Solidworks

Hardware: Jetson Xavier, Jetson Nano, RaspberryPi, Arduino, ESP32, Bolt10, Scout Mini, WeGo-ERP42

Languages: Korean (Native), English (Fluent, iBT TOEFL 103 / exp Oct *2025, personal best 111*)