

DAHUI SONG

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EDUCATION

University of Illinois at Urbana-Champaign
Master of Science in Mechanical Engineering

Aug 2023 – May 2025
GPA: 3.81/4.00

Sookmyung Women's University
Bachelor of Science in Mechanical Systems Engineering and Software Engineering

Mar 2019 – Feb 2023
GPA: 3.68/4.00

TECHNICAL SKILLS

Lab/Research Processes: Robotics, Control, Path Planning, Motion Planning, Computer Vision, AI, Sensor Integration

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

Applications: OpenCV, PyTorch, TensorFlow, AutoCAD, SolidWorks, ROS 1/2, Simulink, LabVIEW, Gazebo

Spoken Languages: Korean, English

WORK EXPERIENCE

Intelligent Motion Laboratory
Graduate Researcher

Champaign, IL
Feb 2024 – Sep 2024

- Contributed to a **robotic OCT eye examination system** in collaboration with Duke University and the NIH. Collected and preprocessed datasets by annotating facial keypoints on public images and those captured in the project environment via a custom PyTorch workflow
- Led qualitative and quantitative stress tests to identify system limitations, thoroughly documented performance shortcomings, fine-tuned model hyperparameters, and enhanced system reliability across varied operating conditions
- Designed a custom four-point calibration within ROS using C++ to refine depth estimation from ZED camera data. Benchmarked against the standard approach, achieving a 5% gain in depth accuracy under various conditions

Autonomous Mechanical Systems Laboratory
Undergraduate Researcher

Seoul, South Korea
Apr 2020 – Mar 2022

- Preprocessed video data for the **First Vision for Vitals Challenge** by extracting regions of interest and using pyVHR for remote heart rate estimation, contributing to a model that achieved 4th place in the competition
- Refined a 70K image dataset for the AI-Hub **Driver Distraction Detection project** by removing duplicates and mislabeled samples, and extracting key visual features to ensure robust training inputs
- Trained and fine-tuned a DNN classifier, leveraging TensorFlow and scikit-learn for hyperparameter sweeps, improving detection accuracy by 15% over the baseline

PROJECT HIGHLIGHTS

Toward Engineering AGI: Benchmarking the Engineering Design Capabilities of LLMs

Jan 2025 – May 2025

- Developed and evaluated engineering design benchmarks (robot control, language-based manipulation, path planning) using LLMs and Webots
- Built an end-to-end automated framework for task generation, execution, and performance validation

Cyber Sailer

Sep 2024 – May 2025

- Designed structural hardware for an autonomous land yacht using AutoCAD, with a focus on mechanical optimization for terrain adaptability
- Developed real-time navigation, path planning, and obstacle avoidance algorithms through sensor fusion and GPU-accelerated computation

Dog Bot

Aug 2023 – Dec 2023

- Designed and prototyped a robot dog using SolidWorks, incorporating 3D printing and motion studies for smooth actuation, and soldered the control board to integrate electronics
- Developed fetching function using PID control, programming in C and LabVIEW to achieve 90% accurate navigation