

# Daewon Kim

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## Research Interests

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System Verification

Computational Mechanics

Embedded System

## Education

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**Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, Korea Mar 2026

MS in Mechanical Engineering

- Computational Mechanics & Structural Systems Laboratory
- Advisor: Prof. Phill-Seung Lee

**Daegu Gyeongbuk Institute of Science and Technology (DGIST)**, Daegu, Korea Feb 2020 – Feb 2026

BS in Mechanical Engineering

- GPA: 4.04/4.30, Summa Cum Laude

## Experiences

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**Research Intern** June 2025 – Aug 2025

Computational Mechanics & Structural Systems Laboratory, KAIST – Daejeon, Korea

- Advisor: Prof. Phill-Seung Lee

**Undergraduate Researcher** Dec 2023 – Dec 2025

DGIST Infineon Autonomous Lab (DIA Lab), DGIST – Daegu, Korea

- Advisor: Ph.D. Seonghun Lee
- Topic: Analysis of the Hands-Off Detection System in a Capacitive Steering Wheel
- Conducting research on vehicle embedded systems for enhancing Hands-Off Detection (HOD) using capacitive touch sensors.

**Visiting Student** June 2023 – Aug 2025

University of California Berkeley Summer Sessions – Berkeley, CA

- Multi/Interdisciplinary studies

**Undergraduate Researcher** June 2020 – July 2020

Surgical Robotics & Augmented Reality Lab, DGIST – Daegu, Korea

- Advisor: Prof. Jaesung Hong
- Topic: Design Manipulator of Wire-based 1-axis Flexible Type Surgical Robot
- Designed the actuator mechanism and gained experience in robot design and 3D modeling.

## Publications

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6. **Daewon Kim**, Taesang Park, Choongpyo Jeong, Jaeseong Lee, Gwangmin Park and Seonghun Lee\*, “Impact of Driver Characteristics and Environmental Conditions on HOD System Adaptability”, *PRESM 2025*, July. 2025.
5. **Daewon Kim**, Sunwoo Yu, Jaehyeon Lee and Seonghun Lee\*, “Development of a Driver Monitoring System Using the Capacitive Steering Wheel and FMCW Radar”, *The Korean Institute of Communications and Information Sciences (KICS) Conference (Fall)*, pp. 1111-1112, Nov. 2024.
4. **Daewon Kim**, Jaeseong Lee, Taesang Park, Choongpyo Jeong and Seonghun Lee\*, “Development of a Capacitance Sensing System for Large-Area Simple Touch Sensors”, *Institute of Embedded Engineering of Korea (IeMeK) Conference (Fall)*, pp. 59-60, Nov. 2024.
3. Jaehyeon Lee, Sunwoo Yu, **Daewon Kim**, and Kiwon Choi, “Multi-patching: life-log Classification with the Reconstructed Representation of Multivariate Time Series”, *The 15th International Conference on ICT Convergence (ICTC 2024)*, pp. 798-803, Oct. 2024.
2. **Daewon Kim**, Jaeseong Lee, Taesang Park and Seonhun Lee\*, “Analysis of Capacitive Touch Sensors in Automotive Steering Wheel”, *Korea Society Automotive (KSAE) Conference (Spring)*, pp. 1089-1091, June. 2024.
1. **Daewon Kim**, Jaeseong Lee, Taesang Park and Seonhun Lee\*, “Principle and Characteristics of Touch sensor Utilizing conductive Fabric”, *The 19th IeMeK Symposium on Embedded Technology (ISET 2024)*, pp. 205-206, May. 2024.

## Projects

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### Hands-Off Detection (HOD)

Jan 2024 – June 2025

Developed a capacitive sensing-based Hands-Off Detection (HOD) system for real vehicle environments.

- Designed and validated detection algorithms considering factors like glove material, contact pressure, and electromagnetic shielding

### Driver Monitoring System (DMS) based FMCW Radar and Capacitive Steering Wheel

July 2024 – Dec 2024

Developed a driver fatigue detection system combining FMCW radar and capacitive sensors

- Integrated machine/deep learning for FMCW radar signal analysis; deployed GUI-based fatigue alerts

### Four Wheel Steering (4WS) Autonomous Vehicle based Reinforcement Learning

Sept 2024 – Dec 2024

Designed and implemented a 4-wheel independent steering vehicle; applied reinforcement learning for navigation

- Managed end-to-end development: 3D CAD, computer vision, control systems (PID), and embedded software
- Solely responsible for the design of a complex system requiring numerous components, efficiently arranging them through optimized 3D design to ensure unobstructed workflow

### CHOPCHOP: Chopstick Assistance Device

Sept 2024 – Dec 2024

- Created a robotic gripper-based assistive device for individuals with reduced hand strength, also designed to function like a humanoid robot gripper
- Led mechanical design, servo control algorithm development, and ergonomic optimization; demonstrated at a university showcase

### Driver Monitoring System (DMS) based FMCW Radar and Capacitive Steering Wheel

June 2024 – Oct 2024

Proposed a multi-patching framework for life-log classification using reconstructed multivariate time series data.

- Improved temporal representation by learning local patterns through patch-wise attention and reconstruction

## Honors

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- Encouragement Prize, The World Embedded Software Contest 2024, KESSIA (2024)
- Encouragement Prize, Human Understanding AI Paper Challenge 2024, ETRI (2024)
- Dean's List, College of Transdisciplinary Studies, DGIST (2023 Spring & Fall, 2024 Spring, 2025 Spring & Fall)
- Full-Tuition, Scholarship Student (2020 – 2026)

## Skills

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**Languages:** TOEIC: 870 (2024.11.24), TOEFL 85 (2025.03.15)

**Programming:** C/C++, Python, MATLAB (Simulink)

**Libraries/Softwares:** ROS1/ROS2, Gazebo, Arduino, MuJoCo, SolidWorks, 3D CAD, ModusToolbox ^ TM

**Hardware Skills:** 3D printing, soldering and wiring, welding

**Hardware Platforms:** Teensy, STM, PSOC4&6