

Yeongjae Kim

PhD Program in Mechanical Engineering

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EDUCATION

M.E. in Robotics and Technology Convergence, Chung-Ang University, Seoul, South Korea 09.2021 – 08.2023

Advisor: Tae-Hyoung Kim (kimth@cau.ac.kr)

- **GPA:** 4.50 / 4.50
- **Thesis Title:** Optimal H_∞ control synthesis using an input saturation function for handling the actuator saturation issue
- **Field of Study:** Optimization algorithm; Convex optimization; Optimal control; Robust control; Input saturation; Bilinear matrix inequality problem; Multi-objective optimization; Model uncertainty; Static output feedback control

B.S. in Mechanical Engineering, Chung-Ang University, Seoul, South Korea 03.2016 – 08.2021

- **GPA:** 4.19 / 4.50
- **Capstone Project:** Model identification of 3 degree of freedom helicopter
- **Relevant Coursework:** Model identification; System analysis; Robotics; Automatic control; Modern control system engineering; Digital control

RESEARCH and TEACHING EXPERIENCE

Research Assistant 09.2023 – 05.2024

Human-Robot Convergence Research Center, Chung-Ang University, Seoul, South Korea

Teaching Assistant – Lab Experiments on Vibration and Measurement Systems 09.2022 – 12.2022

Chung-Ang University, Seoul, South Korea

Undergraduate Research Assistant 03.2020 – 08.2021

Intelligent Mechatronics & Robotics Laboratory, Chung-Ang University, Seoul, South Korea

Internship Program – Mechanical Engineering Short Term Research Program, 2019 Winter 01.2020 – 03.2020

Mechanical Engineering Department, Chung-Ang University, Seoul, South Korea

NOTABLE PROJECTS

Multi-objective H_∞/GH_2 static output controller design based on uncertainty model of active suspension system for 7-degree of freedom full-vehicle 03.2021 – 07.2023

Chung-Ang University, Seoul, South Korea

AWARDS and GRANTS

CAU Graduate Research Scholars, Chung-Ang University Graduate School (Full tuition waiver) 09.2021 – 08.2023

Teaching Assistant, Chung-Ang University Graduate School (₩3,520,000) 2022

Department Secondary Honor Scholarship, Chung-Ang University (₩1,580,000) 2020

JOURNAL PUBLICATIONS

1. **Kim, Y.**, Kim, M., Kanno, M., & Kim, T. H. (2024). Meta-heuristic optimization-based robust H_∞ controller design for active suspension systems subject to actuator saturation. *Alexandria Engineering Journal*.
2. **Kim, Y.**, Kwak, T., Kanno, M., & Kim, T. H. (2023). Multi-objective finite-frequency H_∞/GH_2 static output-feedback control synthesis for full-vehicle active suspension systems: A metaheuristic optimization approach. *IEEE Access*.
3. Kwak, T., **Kim, Y.**, Hori, Y., & Kim, T.H. (2023). Graphical and analytical approaches for analyzing collective behavior of dynamic multi-agent systems governed by generalized cyclic pursuit mechanism. *IEEE Access*.
4. Kim, T. H., **Kim, Y.**, Kwak, T., & Kanno, M. (2022). Metaheuristic Identification for an Analytic Dynamic Model of a Delta Robot with Experimental Verification. In *Actuators* (Vol. 11, No. 12, p. 352).

CONFERENCE EXPERIENCE

Poster Presentation

1. **IEEE/ASME International Conference on Advanced Intelligent Mechatronics**, Seattle, WA, United States (June 2023)
Kim, Y., Kim, M., Kim, T.H. “Robust optimal H_∞ control for active suspension system using input saturation function”
2. **Institute of Control, Robotics and Systems**, Geoje, South Korea (June 2022)
Kim, Y., Kim, T.H. “ H_∞ state feedback controller for active suspension model with considering actuator saturation”

Contributed Presentation

1. **IEEE Congress on Evolutionary Computation**, Yokohama, Japan (July 2024)
Choi, S., **Kim, Y.**, Kim, T.H. “Multi-objective finite-frequency H_∞/GH_2 static output feedback control for input-delayed active suspension system of in-wheel motor driven electric full-vehicle”
2. **IEEE Congress on Evolutionary Computation**, Chicago, IL, United States (July 2023)
Kim, M., **Kim, Y.**, Kim, T.H. “Meta-heuristic algorithm for model order reduction using the Nu-Gap Metric”
3. **IEEE/ASME International Conference on Advanced Intelligent Mechatronics**, Seattle, WA, United States (June 2023)
Kwak, T., **Kim, Y.**, Kim, T.H. “Formation analysis of dynamic multi-agent systems controlled by a generalized cyclic pursuit mechanism”

SKILLS

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|---------------------|---------------------|------------------------|
| • MATLAB & Simulink | • Optimization | • Python |
| • Machine Learning | • Deep Learning | • Programming |
| • CAD | • AUTODESK Inventor | • Interpersonal Skills |

REFERENCES

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