

# Myeongseok Ryu

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*Myeongseok Ryu is under Ph.D. course. (compiled on December 6, 2025)*

## RESEARCH INTERESTS

### Control Theory

Adaptive Control, Optimal Control

### Neural Network-based Control

Neuro-Adaptive Control, Reinforcement Learning

### Contraction Theory

### Online Optimization

## PROFILE & LOGOS



**KAIST**

**MICLab**

Mobility Intelligence and Control Laboratory

## EDUCATION

### Korea Advanced Institute of Science and Technology (KAIST), Korea

September 2025 – Present

CCS Graduate School of Mobility

*Ph.D. of Science in Mobility Engineering*

- Supervisor: Prof. Kyunghwan Choi, KAIST

### Gwangju Institute of Science and Technology (GIST), Korea, (Withdrew for further studies)

March 2025 – May 2025

School of Mechanical Engineering

*Ph.D. of Science in Mechanical Engineering*

### Gwangju Institute of Science and Technology (GIST), Korea

March 2023 – February 2025

School of Mechanical Engineering

*Master of Science in Mechanical Engineering*

- Thesis: Constrained Optimization-Based Neuro-Adaptive Control (CoNAC) for Euler-Lagrange Systems
- Supervisor: Prof. Kyunghwan Choi, GIST

### Incheon National University (INU), Korea

March 2017 – February 2023

Department of Mechanical Engineering

*Bachelor of Engineering*

## PROFESSIONAL EXPERIENCE

### Korea Advanced Institute of Science and Technology (KAIST), Korea

May 2025 – August 2025

*Part time Contract Research Scientist*

- Research on Neural Network-based Control for Mobility Systems

## SKILLS

**Languages:** Korean, English

**Programming:** Matlab/Simulink, Python, C/C++

**Implementation:** Simulation CarMaker, ROS

Others Git, LaTeX, Jekyll

## PUBLICATIONS

### Papers Under Review

3. Vector-Space Optimization for Contraction Theory-Based Control Design: An Energy-Based Effective Space Approach  
**Myeongseok Ryu**, Kyunghwan Choi, Sesun You<sup>\*</sup>  
*International Federation of Automatic Control (IFAC), 2026*

2. All-Wheel Steering Vehicle Control Based on Contraction Theory with Neural Network  
**Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*IEEE International Conference on Advanced Motion Control (AMC), 2026*

1. Constrained Optimization-Based Neuro-Adaptive Control (CONAC) for Euler-Lagrange Systems Under Weight and Input Constraints  
**Myeongseok Ryu**, Donghwa Hong, Kyunghwan Choi<sup>\*</sup>  
*IEEE Transactions on Systems, Man, and Cybernetics, 2025*

## International Conference Papers

4. Physics-Informed Online Learning of Flux Linkage Model for Synchronous Machine  
Seunghun Jang, **Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*Annual Conference of the IEEE Industrial Electronics Society (IECON), 2025*
3. Constrained Optimization-Based Neuro-Adaptive Control (CONAC) for Synchronous Machine Drives Under Voltage Constraints  
**Myeongseok Ryu**, Niklas Monzen, Pascal Seitter, Kyunghwan Choi, Christoph M. Hackl<sup>\*</sup>  
*Annual Conference of the IEEE Industrial Electronics Society (IECON), pp. 1-7, 2025*
2. Imposing a Weight Norm Constraint for Neuro-Adaptive Control  
**Myeongseok Ryu**, Jiyun Kim, Kyunghwan Choi<sup>\*</sup>  
*European Control Conference (ECC), pp. 380-385, 2025*
1. A Comparative Study of Reinforcement Learning and Analytical Methods for Optimal Control  
**Myeongseok Ryu**, Junseo Ha, Minji Kim, Kyunghwan Choi<sup>\*</sup>  
*International Workshop on Intelligent Systems (IWIS), pp. 1-5, 2023*

## Domestic Conference Papers

3. Approximation-based Steering Controller with Deep Neural Network  
**Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*제어로봇시스템학회 (ICROS), pp. 884-885, 2024*
2. Integrated Motion Control of Four in-Wheel Motor Actuated Vehicles Considering Path Tracking, Ride Comfort, and Energy Efficiency  
**Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*한국자동차공학회 추계학술대회 (KSAE), pp. 490, 2023*
1. Data-driven Modeling of Model Residuals for Linear Model Predictive Control of Nonlinear Systems  
**Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*제어로봇시스템학회 (ICROS), pp. 837-838, 2023*

## Preprint Papers

1. CNN-based End-to-End Adaptive Controller with Stability Guarantees  
**Myeongseok Ryu**, Kyunghwan Choi<sup>\*</sup>  
*Arxiv, 2024*

## GRANTS AND AWARDS

<b>IEEE International Workshop on Intelligent Systems (IWIS)</b> <i>Best Presentation Paper Award</i>	<i>July 2025</i>
<b>European Control Association (EUCA)</b> <i>Student Support</i>	<i>June 2025</i> 400 EUR
<b>Graduate International Research Experience Fellowship (GIST-IREF)</b> <i>Research Support</i>	<i>October 2024</i> 16 million KRW (approx. 12,000 USD)
<b>Institute of Control, Robotics and Systems (ICROS)</b> <i>Best Paper Award</i>	<i>June 2023</i>
<b>INU MATLAB Cody Challenge</b> <i>Top Prize</i>	<i>June 2021</i>