

Soohyun Choi

Integrated M.S./Ph.D. Student in Electronic Engineering | Reinforcement Learning
Hanyang University • Information and Intelligence Systems Lab (IISL) • Seoul, Republic of Korea
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Research Interests

My research focuses on reinforcement learning, particularly the mathematical and geometric analysis of learning algorithms. I develop algorithms and modeling frameworks using generative models and stochastic processes for goal-conditioned and long-horizon control.

Education

Hanyang University

Sep. 2024–Present

Integrated M.S./Ph.D. Program in Electronic Engineering

Information and Intelligence Systems Lab (IISL) • Advisor: Prof. Songnam Hong

Hanyang University

2018–2024

B.S. in Electronic Engineering

Preprints

PathBridger: Subgoal Bridges for Offline Goal-Conditioned Reinforcement Learning

2026

Soohyun Choi^{}, Seonvin Cho^{*}, and Songnam Hong^{*} • ^{*}Equal contribution • [arXiv:2608.29061](https://arxiv.org/abs/2608.29061) • [Code](#)*

Developed a hierarchical offline GCRL framework that connects subgoal selection to short-horizon execution through state-space bridges, inverse dynamics, and execution-time replanning.

Multi-step Proximal Policy Improvement in Offline Reinforcement Learning

2026

Soohyun Choi^{}, Seonvin Cho^{*}, and Songnam Hong[†] • ^{*}Equal contribution • [†]Corresponding author • [arXiv:2609.03842](https://arxiv.org/abs/2609.03842) • [Code](#)*

Developed a plug-in offline policy-refinement framework that composes re-centered proximal steps on a policy manifold and analyzes how step size and critic error govern finite-step improvement.

Research Experience

Graduate Researcher, Information and Intelligence Systems Lab

Sep. 2024–Present

Hanyang University • Advisor: Prof. Songnam Hong

Research on mathematical and geometric analysis for offline policy optimization and generative modeling for long-horizon control. Current work includes MART, AMO, and PathFlower.

Research Participant, SK hynix–Hanyang University Project

2024–2025

REACT: Recursive Algorithm for RC Network Transfer Functions

Developed a recursive closed-form transfer-function method for arbitrary RC trees and a dominant-pole reduced-order approximation validated against SPICE.

Selected Research Project

ALARM: Attention and Line Search Based Analog Circuit Optimization on a Riemannian Manifold

2024; rev. 2026

Soohyun Choi, Minseok Oh, and Ickhyun Song • Undergraduate capstone technical report • [Report](#)

Formulated designer-selected performance equivalence classes and quotient geometry for circuit search; achieved 10/10 success with 33.2 SPICE evaluations on average in the archived VCO study.

Honors & Funding

Top Excellence Award - Alumni Association Special Award

2023

Top Excellence Award - 15th Capstone Design Fair

2023

Graduation Honors, Hanyang University

2024

BK Research Assistantship, Hanyang University

Fall 2025

Selected Graduate Coursework

Learning & Control: Machine Learning; Robot Learning; Advanced Optimal Control Theory

Probability & Analysis: Probability and Statistics; Stochastic Processes; Uncertainty Quantification; Functional Analysis I