HYEONWOO CHOI 최현우

Interests

Deep Learning
Natural Language Processing
Test-time scaling
System 2 Reasoning & Search
Graph Structured Memory & State
Spectral Graph Theory
Amortized (Efficient) Inference

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Github

Education

Bachelor of Mathematics, Pusan National University 2023.03.02. - Present

- GPA: 4.43 (Major 4.46) / 4.5
- Coursework: (**Linear**/Group/Ring) **Algebra**, **Probability & Statistics**, (Elementary/Algebraic) Topology, (**Mathematical**/**Real**/Complex/**Vector**) **Analysis**, Calculus, Set Theory, **Mathematical Programming**, (Elementary/Differential) Geometry

Research Experience

PNU Data Intelligence Lab, Undergraduate Research Student (Advisor: Prof. Junsu Cho) 2025.03.24. - Present

- Actively participating in monthly lab seminars on Recommender System and Natural Language Processing
- Engaging in paper reviews and code reproduction for state-of-the-art reasoning models.

Technical background

Languages : Python, C
Databases: MySQL
Libraries: PyTorch, vLLM, LightRAG
Tools : Git, VScode (Cursor), Conda, Docker, Linux (Ubuntu), pdb/ipdb, LaTeX (TexStudio, Overleaf)

Awards

Dean's Award (1st place in Dept. of Mathematics) - Fall 2023, Fall 2024, Spring 2025 2024.03.22, 2025.03.21, 2025.09.26

- College of Natural Sciences, Pusan National University **(Awarded 3 times)**

Winner (1st place), PNU AID Hackathon (Season 2) 2025.01.19. - 2025.01.23.

- Outperformed **ViT** competitors by validating dataset quality with **kNN clustering** and strategically fine-tuning **EfficientNet**, proving lightweight models' superiority in high-quality data regimes.
- Led a cross-functional team of 3 undergraduates (Statistics, CS, Math majors).

Activities

Lead Organizer, NLP Study Group @ AI Academic Club (PNU AID) 2024.09.22. - 2024.12.07.

- Textbook: Dan Jurafsky and James H. Martin, Speech and Language Processing, Part I
- Managed the 10-week curriculum and documented all study materials/codes on (GitHub)

Projects

Graph-augmented Buffer of Thoughts (Graph-BoT) | Undergraduate Researcher 2025.08.18. - Present

- (Status: Manuscript in preparation for submission, Advised by Prof. Junsu Cho)
- Proposing **a persistent graph-structured memory framework** to resolve the episodic amnesia of reasoning models (ToT, GoT).
- Formulating reasoning as **a stateful transition process on a Meta-Graph**, utilizing Spectral Graph Theory (Laplacian centrality) for topological pruning.
- Conducting experiments on **Game of 24** and **MATH benchmarks**; preliminary results show Pareto-efficient trade-offs compared to baseline prompting methods.