JUNIK BAE

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EDUCATION

Seoul National University 2019 - Present
Bachelor of Computer Science and Engineering *Seoul, South Korea*
GPA: 4.08 / 4.30 (Cumulative), 4.09 / 4.30 (Major)
Leave of absence for military service: Feb 2021 - Nov 2022

PUBLICATIONS

[**P1**] TLDR: Unsupervised Goal-Conditioned RL via Temporal Distance-Aware Representations
Junik Bae, Kwanyoung Park, Youngwoon Lee
Conference on Robot Learning (CoRL), 2024

[**P2**] Exploiting Semantic Reconstruction to Mitigate Hallucinations in Vision-Language Models
Minchan Kim*, Minyeong Kim*, **Junik Bae***, Suhwan Choi, Sungkyung Kim, Buru Chang
(*: equal contribution)
European Conference on Computer Vision (ECCV), 2024

RESEARCH INTERESTS

My research goal is to develop scalable frameworks for unsupervised learning that allow agents to (1) autonomously explore the environments and (2) learn a broad range of behaviors (3) while utilizing large-scale datasets. Particularly, my interests include:

- **Autonomous exploration**
- **Unsupervised reinforcement learning**
- **Offline reinforcement learning**

AWARDS AND HONORS

- **1st Place**, 2022 Military AI Competition Nov 2022 - Dec 2022
  Awarded by Korean Minister of Science and Technology, ₩20,000,000 (≈ $15,000)
  Preliminary Task: Change detection on buildings in aerial image data
  Final Task: Image denoising for all-weather operations
- **2nd Place**, 2022 Korean AI Competition Aug 2022 - Sep 2022
  Awarded by Korean Minsiter of Science and Technology, ₩10,000,000 (≈ $7,500)
  Task: Speech recognition on Korean dialect speech datasets
- **2nd Prize**, Product Recognition Challenge on Self-service Stand Sep 2021 - Oct 2021
  Awarded by Chairman of Electrical and Computer Engineering Department at SNU
  Task: High-precision-and-speed object detection on self-service stand images
- **SNU Semiconductor Track Scholarship** Mar 2024 - Present
  Scholarship of ₩10,000,000 (≈ $7,500) to be conferred upon graduation

EXPERIENCE

Yonsei RLLAB **Research Intern** Mar 2024 - Present
Advisor: Prof. Youngwoon Lee

- Researched and developed unsupervised goal-conditioned RL algorithm leveraging *temporal distance* for both exploration and goal-reaching [**P1**].
- Working on follow-up project on goal-conditioned RL.

SNU Deep Learning Research Club **Member (13th Cohort)** Sep 2023 - Feb 2024
Advisor: Prof. Buru Chang

- Co-developed framework to mitigate hallucinations in vision-language models using semantic image reconstruction and reinforcement learning [**P2**].

SNU Vision and Learning Lab **Research Intern** Jul 2023 - Sep 2023
Advisor: Prof. Gunhee Kim

- Developed face generation and video scene segmentation pipeline used in MBC entertainment show.
- Researched lifelong evaluation pipelines for retrieval-augmented generation models on dynamic text data streams.

Naver Cloud Speech Synthesis Team **Research Intern** Jan 2023 - Feb 2023

- Designed and implemented text-to-speech (TTS) model tailored for proprietary Korean speech data.

Republic of Korea Air Force **Software Development Specialist** Feb 2021 - Nov 2022

- Developed AI models to detect prohibited items in X-ray images.
- Built ML pipelines for gunshot detection and scoring during shooting training.
- Developed ML forecasting pipeline to predict munitions demand.

PROJECTS

- **TTS Model Implementation. (450+ stars)** Implemented *NaturalSpeech: End-to-End Text to Speech Synthesis with Human-Level Quality* by Microsoft, former state-of-the-art model on LJ Speech Dataset. This is the first and only public implementation to the best of my knowledge. (Github link)