

# Sieun Choi

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## EDUCATION

### Dongguk University

Seoul, Korea

*M.S./Ph.D. in Computer · Artificial Intelligence*

*Mar 2024 - M.S. expected Feb 2026*

- Cumulative GPA: 4.5/4.5
- Research Interests: Multimodal Learning, Vision-Language Alignment, Reinforcement Learning

*B.E. in Information and Communication Engineering*

*Mar 2019 - Feb 2024*

- Graduated Magna Cum Laude | Cumulative GPA: 4.16/4.5 | Major GPA: 4.29/4.5

### Purdue University

West Lafayette, IN

*Visiting Scholar*

*Oct 2021 - Dec 2021*

- Developed an IoT-based farm fire detection and response system using drones and LoRa communication
- Designed a testbed and implemented control algorithms for infrared-guided drone navigation

## PROFESSIONAL EXPERIENCE

### Teaching Assistant

*Computer Network and Security*

*Spring 2024, Spring 2025*

*Computer System*

*Fall 2024, Spring 2025*

*Data Science Capstone Design*

*Spring 2024, Fall 2024, Spring 2025*

### Technology Team Intern

San Jose, CA

*Cipherome, Inc*

*Mar 2023 - Feb 2024*

- Developed statistical and exploratory data analysis modules for COMPASS, a web-based data platform
- Designed web interfaces for COMPASS, enabling dataset extraction, statistical analysis, exploratory data analysis, and Genome-Wide Association Studies
- Preprocessed patient datasets and ensured data integrity for medical research at Samsung Medical Center
- Validated synthetic educational medical datasets for Kangwon National University
- Designed and implemented a website to showcase COMPASS and enable demo requests

### Undergraduate Researcher

*AI Lab, Dongguk University*

*Feb 2022 - Dec 2022*

- Collaborated with the Department of Police Administration to develop an NLP model for automating the classification and analysis of statements from abuse victims
- Contributed to the research of an anaphora resolution model for statement analysis, preprocessing colloquial Korean data

## PROJECT

### Diffusion Model Enhancement for Sketch Generation via Visual Question Answering Feedback

*Submitted to IJCAI 2025 (Awaiting Decision); Patent Application in Progress*

*Mar 2024 - ongoing*

- Developed a pixel-based sketch generation framework that adapts Stable Diffusion for abstract, human-drawn, instance-level sketches with improved prompt fidelity
- Introduced a new VQA-based reward function to improve semantic alignment with textual prompts
- Created a dataset of instance-level sketches paired with fine-grained textual captions and QA pairs

### Machine Learning-Based Common Bile Duct Stone Detection for ERCP Decision Making

*Preparing for submission to Gastroenterology*

*Mar 2024 - ongoing*

- Collaborated with Dongguk University Medical Center to develop a robust common bile duct stone prediction model using decision tree-based stacking ensemble model
- Enhanced model performance through feature selection and SMOTE-based data augmentation

### Dynamic Access Management of Malicious Packets with Reinforcement Learning

*Preparing for submission to IEEE Access*

*Jan 2025 - ongoing*

- Conducted research on dynamic access control in cybersecurity, focusing on reinforcement learning-based management of malicious packet access
- Applied proximal policy optimization for training the base blocking/unblocking policy and fine-tuned with soft actor-critic to optimize blocking time and risk levels

### Mobile Data Loss Prevention System for Real-Time Personal Information Monitoring

Undergraduate Capstone Design

Aug 2022 – Dec 2022

- Developed an Android application to detect personal information leakage by monitoring real-time mobile network traffic using packet capture API
- Designed database schema and relationships to store and manage sensitive data patterns
- Defined regular expression rules to match personal information stored in the database with observed packet data

### AWARD

ICT Challenge 2024

Ministry of Science and ICT, Korea

1st Place

Sep 2024

- Extended the research project *Machine Learning-Based CBD Stone Detection for ERCP Decision Making* by incorporating a multimodal deep learning approach
- Integrated a 3D vision encoder into the LLaVA architecture and fine-tuned it on multimodal clinical data, including CT scans, vitals, labs, and demographics
- Enhanced diagnostic accuracy through modality-specific preprocessing and augmentation for localized lesion detection

ICT Convergence Services Idea Competition based on 5G and AI

KICS, Korea

1st Place

Feb 2021

- Designed a smart kindergarten system leveraging 5G and AI technologies to prevent child abuse and alleviate the workload of educators
- Proposed a smart-city-inspired architecture integrating real-time monitoring, automated reporting, and intelligent activity management for safer and more efficient kindergarten operations

### PUBLICATION

Dedicated Delivery Platform Based on the User Experience of the Visually Impaired

Published in the *Proceedings of the Korea Information Processing Society Conference*

2022

- Developed a dedicated delivery service platform tailored to the needs of visually impaired users
- Conducted user experience research through interviews to identify accessibility challenges in existing delivery services
- Proposed service improvements including voice-based order support, simplified UI/UX design, and improved delivery tracking for better accessibility

### EXTRACURRICULAR ACTIVITY

IJCAI 2024 Volunteer Program

Jeju, Korea

Student Volunteer

Aug 3 - Aug 9

Dongguk University Exchange Student Supporter

Vice president

Aug 2019 - Dec 2019

### LANGUAGE

Korean

Native

English

Business Fluent

- TOEIC 950/990 | OPIc AL | TOEFL ITP 650/677