Sieun(Sienna) Choi

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RESEARCH INTERESTS

Multimodal Learning · Computer Vision · Natural Language Processing · Robotics · Reinforcement Learning

EDUCATION

Dongguk University   Seoul, South Korea
M.S. in Artificial Intelligence   *Mar 2024 - Feb 2026 (expected)*
- Cumulative GPA: 4.5/4.5

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

RESEARCH EXPERIENCE

Bot Intelligence Group (BIG)   Pittsburgh, PA, United States
Visiting Researcher at Carnegie Mellon University – supervised by Dr. Jean Oh   *Aug 2025 - Feb 2026 (expected)*
- Designing culture-aware audits for vision-language models, quantifying cultural bias with standardized metrics, and delivering model-agnostic mitigation that improves fairness without degrading image quality.
- Developing a web-based platform to extract, curate, and analyze culturally grounded data, enabling dataset/model comparisons and reproducible bias-evaluation

Machine Learning Lab   Seoul, South Korea
Dongguk University – supervised by Dr. Jihie Kim   *Mar 2024 - Feb 2026 (expected)*
- Applied reinforcement learning to diffusion-based sketch generation, thereby enabling models to capture abstract concepts and produce human-like sketches; ongoing follow-up on a reference-free sketch evaluation metric
- Collaborated with Dr. Joo Seong Kim (Gastroenterology, Dongguk University Medical Center (DUMC)) on machine-learning-based decision support for endoscopic retrograde cholangiopancreatography (ERCP); ongoing follow-up study on automated, imaging-based measurement of common bile duct diameter

Artificial Intelligence Lab   Seoul, South Korea
Undergraduate Researcher at Dongguk University – supervised by Dr. Gijoo Yang   *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 development of an anaphora resolution model for statement analysis

Machine-to-Machine Lab (M2M)   West Lafayette, IN, United States
Visiting Scholar at Purdue University – supervised by Dr. Eric Matson   *Oct 2021 - Dec 2021*
- Developed and simulated an IoT-based farm fire detection/response system using drones and LoRa communication
- Designed a testbed and implemented control algorithms for infrared-guided drone navigation

PUBLICATIONS

Diffusion Model Enhancement for Sketch Generation via Visual Question Answering Feedback
Undereview; Patent Application in Progress
- 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

ML-Based Prediction of CBD Stones for guiding ERCP decision-making in the Emergency Department
Preprint
- Collaborated with DUMC to develop a common bile duct stone prediction model using decision tree-based stacking ensemble model
- Enhanced model performance through feature selection and SMOTE-based data augmentation

Dedicated Delivery Platform Based on the User Experience of the Visually Impaired *2022*
Published in the Proceedings of the Korea Information Processing Society Conference
- Developed a food 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

OTHER EXPERIENCE

Teaching Assistant
Computer Network and Security (SCS4032)	*Spring 2024 , Spring 2025*
Computer System (SCS2011)	*Fall 2024 , Spring 2025*
Data Science Capstone Design (DSC4007)	*Spring 2024 , Fall 2024, Spring 2025*

Teaching Materials Author
Open Source Software Project (SCS4045) — Docker & Git

IJCAI 2024 Volunteer Program Jeju, South Korea
Student Volunteer *Aug 2024*

Technology Team San Jose, CA, United States
Intern at Cipherome, Inc *Mar 2023 - Feb 2024*
- Developed statistical, exploratory, and machine-learning analysis modules for COMPASS, a web-based medical data analysis platform
- Designed platform interfaces, enabling dataset extraction, analysis, and genome-wide association studies
- Preprocessed patient datasets and integrated medical data into COMPASS for Samsung Medical Center
- Validated and refined synthetic medical datasets for education at Kangwon National University; designed hackathon materials and supported on-site coordination

Dept. Information and Communication Engineering Student Association Dongguk University, Seoul, South Korea
President *2023*

Junior Automotive Enginnering Program Hyundai KEFICO, Gyeonggi, South Korea
Volunteer *May 2020 - Nov 2020*

Exchange Student Supporter Dongguk University, Seoul, South Korea
Vice president *Aug 2019 - Dec 2019*

PROJECTS

SEA: Evaluating Sketch Abstraction Efficiency via Element-level Commonsense VQA *Jul 2025 - ongoing*
- Developed a reference-free metric that evaluates sketch abstraction efficiency via element-level commonsense VQA
- Curated a benchmark for element-level grounding in sketches, enabling standardized evaluation across multimodal models; public release planned

Dynamic Access Management of Malicious Packets with Reinforcement Learning *Mar 2025 - Jul 2025*
- 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 Data Monitoring
Undergraduate Capstone Design *Aug 2022 - Dec 2022*
- Developed an Android application to detect personal data leakage by monitoring real-time mobile network traffic using packet capture API
- Designed the data schema; defined regex rules to reconcile database personal data with observed packet data.

AWARDS & HONORS

ICT Challenge 2024 – 1st Place *Sep 2024*
Ministry of Science and ICT, South Korea
- Extended the research *ML-Based Prediction of CBD Stones for guiding ERCP decision-making* for localized lesion detection by incorporating a multimodal deep learning approach and data augmentation
- Integrated a 3D vision encoder into the LLaVA architecture and fine-tuned it on multimodal clinical data, including CT scans, vitals, labs, and demographics

Merit-Based Scholarship *2022 - 2023*
Dongguk University, Seoul, South Korea

Dean's List *2020 - 2022*
Dongguk University, Seoul, South Korea

Software-Centered Academic Excellence Scholarship *2021*
Dongguk University, Seoul, South Korea

Dongguk Leader Scholarship – Student Representative *2021*
Dongguk University, Seoul, South Korea

ICT Convergence Services Idea Competition based on 5G and AI – 1st Place *Feb 2021*
The Korean Institute of Communications and Information Sciences, South Korea
- Designed the system architecture for a 5G-enabled, AI-assisted smart kindergarten with real-time sensing, abuse/anomaly detection, automated reporting, and activity management to enhance safety and reduce educator workload.

Academic Excellence Scholarship *2020*
Dongguk University, Seoul, South Korea

RELEVANT SKILLS

Programming: Python, C, SQL
Libraries: PyTorch, TensorFlow/Keras, scikit-learn, MONAI, OpenCV, SimpleITK, NumPy, pandas
Systems & Ops: FastAPI, Docker, MySQL, AWS, Git, GitHub Actions, Linux (Ubuntu), LaTeX
Languages: English(IELTS 8.0), Korean(Native)