

SUHWAN TCHA

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Research Interests

My research is committed to developing **human-like and trustworthy Artificial Intelligence** that bridges computer vision and multimodal understanding. Recent primary interests have been building **robust and interpretable vision-language models**, with a focus on:

- (1) **Object Detection and Efficient Architectures** for real-time inference;
- (2) **Multimodal Fusion** of visual and linguistic cues for affective computing;
- (3) **Behavioral Analysis** from static and dynamic visual inputs;
- (4) **Trustworthy AI Systems** ensuring fairness, robustness, and real-world deployability.

Education

Sogang University (Transferred 2024)

Seoul, South Korea

B.S. IN COMPUTER SCIENCE

Expected Aug. 2026

- Relevant Coursework: Deep Learning, Machine Learning, Big Data Computing

Hankuk University of Foreign Studies (HUFS)

Seoul, South Korea

INFORMATION & COMMUNICATION ENGINEERING

2020 – 2023

- Transferred to Sogang University in 2024

Projects

CONVENIENCE STORE CHAIN DATABASE SYSTEM

2025

- The Convenience Store Chain Database System is a project implementing a database management solution for store and online purchases, using MySQL database and C++ application. It includes inventory management, sales transactions, loyalty status updates (VIP/VVIP), and support for 7 sample queries covering business needs like stock inquiries, sales analysis, and purchase pattern analysis. The system is designed with an E-R diagram-based logical schema normalized to **BCNF** for data integrity and query performance.
GitHub: github.com/suhwantcha/Convenience-Store-Chain-Database-System

YOLO-PSYCHO-ANALYSIS (PSYCHOLOGICAL ANALYSIS FROM HOUSE SKETCHES)

2025

- The AI House Drawing Psychological Analysis Model is a **YOLOv8**-based project that diagnoses psychological characteristics by detecting and quantifying elements like doors, windows, sun, and chimney in user-drawn sketches. It converts data into psychological scores and provides customized analysis scripts grounded in HTP test theory and art therapy.
GitHub: github.com/suhwantcha/YOLO-Psycho-Analysis

SEOUL REAL ESTATE PRICE PREDICTION TEAM PROJECT (4 MEMBERS)

2025

- This project predicts transaction prices for properties in Seoul using official data, involving preprocessing, feature engineering (e.g., building age, floor categories), encoding, and log transformation of the target variable (house_price). It employs multiple ML models including Random Forest, **XGBoost**, CatBoost, and KNeighbors.
GitHub: github.com/suhwantcha/Seoul-Housing-Price-Prediction

EFFICIENTNET DOG & CAT CLASSIFICATION TEAM PROJECT (4 MEMBERS)

2024

- This project implements image classification on the Oxford-IIIT Pet Dataset, utilizing transfer learning with **EfficientNet-B0** and systematically optimizing factors like data augmentation and regularization, using CutMix and achieving **88.08% validation accuracy**.
GitHub: github.com/suhwantcha/efficientnet-Image-classification

CAT-TRANSLATOR

2025

- The Cat Meow Translator & Meme Generator analyzes uploaded cat meow audio (WAV, MP3) using the **Gemini API** to translate them into humorous human-like phrases, then generates a corresponding meme image via **Stable Diffusion** on Hugging Face. It features dual versions: a Python-based Streamlit app and a simple React frontend.
GitHub: github.com/suhwantcha/Cat-translator

YOLO OBJECT DETECTION (YOLOv5, YOLOv7, AND YOLOv11)

2024

- This project demonstrates training and evaluating YOLO models (**YOLOv5, YOLOv7, and YOLOv11**) for object detection using the PASCAL VOC dataset, including data preprocessing (XML to .txt format), model retraining via transfer learning, and performance evaluation (mAP). Optimized for real-time object detection.
GitHub: github.com/suhwantcha/yolo-object-detection

SYSTEM PROGRAMMING PROJECTS

2025

- This repository covers four projects from the System Programming course: MyLib (kernel data structures), MyShell (custom shell with I/O redirection and job control), Concurrent Stock Server (multi-client server using POSIX threads, handling **10K+ clients**), and Mallocator (custom dynamic memory allocator). Technologies include C, system calls, and concurrency libraries.
GitHub: github.com/suhwantcha/System-Programming

SELF-EVOLVING MULTIMODAL CS AGENT FOR SMART STORE OPERATIONS TEAM PROJECT (5 MEMBERS)		Sep 2025 – Present
<ul style="list-style-type: none"> Built Multimodal RAG with GPT-4o Vision/Whisper and ChromaDB for text, image, and voice customer data. Implemented self-correction logic using PostgreSQL logs and dynamic prompting to enforce owner policies. Enabled autonomous tool generation: CS replies, BI reports, marketing tools. FastAPI + LLaMA/Mistral backend. GitHub: github.com/suhwantcha/CS-Agent		
PINTOS OS		Sep 2025 – Present
<ul style="list-style-type: none"> Pintos OS is an educational operating system kernel implementation in C, focusing on core features. Completed: argument passing, memory protection and file system management (Projects 1 & 2). In progress: thread scheduling, and virtual memory systems. GitHub: github.com/suhwantcha/OS-Pintos-Project		

Experience

Teaching Assistant, Understanding Artificial Intelligence		Seoul, South Korea
SOGANG UNIVERSITY		Sep 2025 – Dec 2025
<ul style="list-style-type: none"> Assisted in an Introduction to Artificial Intelligence course for over 50 students supporting attendance and Q&A. Conducted **PyTorch**-based labs on core deep learning architectures, including CNNs and Transformers. Guided hands-on implementation of deep learning models and graded assignments. 		
Teaching Assistant, Computer Architecture		Seoul, South Korea
SOGANG UNIVERSITY		Mar 2025 – Jun 2025
<ul style="list-style-type: none"> Assisted in the overall progress of the Computer Architecture course. Supported 40+ students in understanding computer systems fundamentals. 		
Mentor, Parrot Data Science Club		Seoul, South Korea
SOGANG UNIVERSITY		Mar 2025 – Jun 2025
<ul style="list-style-type: none"> Guided 5 junior members in data analysis projects and CNN-based computer vision projects. Organized internal Kaggle-style ML competitions and technical workshops. 		
Runner-up, Sogang AI Data Analysis Runnerthon		Seoul, South Korea
SOGANG UNIVERSITY		Jan 20 – Feb 14, 2025
<ul style="list-style-type: none"> Built real estate price forecasting model in a team of 4. Secured 2nd place among 15 competing teams with XGBoost-based solution. 		
Teaching Assistant, English & Mathematics		Seoul, South Korea
MEGASTUDY RUSSEL & YESUM ACADEMY		Feb 2024 – Present
<ul style="list-style-type: none"> Tutored 30+ students in analytical problem-solving and critical thinking. Assisted in classroom management and lesson preparation for middle/high school students. 		
Satellite Operation Squad Leader		South Korea
REPUBLIC OF KOREA ARMY		Jan 2022 – Jul 2023
<ul style="list-style-type: none"> Supported stable communication across different military branches by operating the Military Satellite Communication System. Demonstrated mission stability and rapid response capabilities in real-world combat readiness operations, ensuring uninterrupted communication services. As a Squad Leader, managed and led a team of 7 members, overseeing the maintenance, inspection, and operation of all satellite equipment, enhancing mission readiness. 		

Activities

Autonomous Taxi Design Project		Seoul, South Korea
SOGANG UNIVERSITY		Jul 2025 – Aug 2025
<ul style="list-style-type: none"> Designed autonomous taxi systems, focusing on the integration of AI for navigation and safety protocols. Prioritized the development of cost-effective methodologies for sensor fusion and environmental perception in the design. 		
Member, Parrot Data Science Club		Seoul, South Korea
SOGANG UNIVERSITY		Sep 2024 – Present
<ul style="list-style-type: none"> Active member in data science and AI study group. Regularly participated in projects involving advanced data analysis and deep learning frameworks. 		
2023 Military Personnel Software and AI Competency Enhancement Training Program		South Korea
REPUBLIC OF KOREA ARMY		Jan 2023 – May 2023
<ul style="list-style-type: none"> Completed intensive training in software development and AI applications. Executed a weather forecasting project using real-world data and machine learning models. 		

Completed English Training Program

HANKUK UNIVERSITY OF FOREIGN STUDIES (HUFS)

- Participated in university-hosted intensive English language program.
- Improved fluency in academic and technical English communication.

Seoul, South Korea

Oct 2021 – Dec 2021

Member, English Conversation Club

SHALLA, SEOUL UNIVERSITY STUDENT UNION CLUB

- Engaged in weekly English conversation practice and cultural exchange.
- Developed confidence in real-time spoken English with peers.

Seoul, South Korea

2021

Technical Skills

ML/DL Frameworks, PyTorch, TensorFlow, Hugging Face, LangChain, scikit-learn

Languages, Python, C/C++, SQL, R

Tools, Git, Linux, VS Code, Google Colab, MySQL, Jupyter Notebook, CLion, Notion

Data/Vision, Pandas, Numpy, Seaborn, OpenCV, Pillow, Cutmix

Languages

Korean, Native

English, Fluent

Japanese, Basic (Studying)