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EDUCATION

B.S. in Computer Science and Engineering

Seoul National University

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PROJECTS

Database Management System

- Implemented a database management system from scratch in Python, supporting core DML operations including INSERT, DELETE, and SELECT.
- Developed a SQL parser using Lark and implemented query processing for WHERE, JOIN, ORDER BY, LIMIT, and OFFSET clauses.
- Implemented data validation and error handling for type mismatches, invalid column/table references, ambiguous references, and constraint violations.
- Integrated LMDB for persistent database storage and implemented query execution according to the specified DBMS requirements.

Emotionally-Aware Literary Quote Retrieval System

- Developed an emotion-aware semantic retrieval system over 32 public-domain literary works.
- Designed an 8-dimensional emotion representation using semantic similarity between literary passages and emotion prototypes.
- Developed a ranking pipeline combining emotional relevance with literary quality for single- and multi-emotion queries.
- Evaluated msmarco-distilbert-base-v4 and all-mpnet-base-v2 against BM25 baselines across 12 queries, achieving mean P@10 of 0.53 and 0.63, respectively.

Local Business Discovery Application

- Designed and implemented the Supabase database architecture, creating tables for users, businesses, images, and associated metadata.
- Integrated the Google Places API to retrieve business information and images, using unique Google Place IDs to identify businesses.
- Developed a semantic search system using OpenAI's text-embedding-3-small, generating and storing business embeddings in Supabase and embedding user queries for semantic matching.
- Implemented a Supabase Edge Function to process user queries through the OpenAI embedding API, enabling natural-language searches such as "date night" and "vegan places".

Boxing Coach Application

- Developed a video-analysis pipeline that samples recorded boxing footage and performs human pose estimation using MoveNet Lightning.
- Extracted pose key points and derived motion features (wrist velocity peaks, wrist activity, shoulder rotation, guard position) to generate structured feedback via the Claude Haiku API.

SKILLS

Languages: Java, Python, SQL

Frameworks: Django, PyTorch, React, React Native, TensorFlow

Databases & Backend: LMDB, MySQL, SQLite, Supabase

AI/ML: MoveNet Lightning, Sentence Transformers

Tools: Docker, Git, Github