

# Junsoo Kim

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## EDUCATION

### University of Southern California | Los Angeles, CA

2023 – Expected May 2027

#### Bachelor of Science in Computer Engineering Computer Science

GPA: 3.92/4.0

- **Relevant Coursework:** Principles of Software Development (Java), Data Structures and Object-Oriented Design (C++), Probability Theory
- **Activities:** Vice President of USC KSEA, Undergraduate Researcher

## EXPERIENCE

### University of Southern California, GVL Lab

Los Angeles, CA

#### Undergraduate Researcher

August 2025 – Present

- Managing data collections and preprocessing for large-scale robotic datasets, ensuring high-quality inputs for training machine learning models.
- Working with 6+ graduate students to develop robotics simulation platform, contributing to ongoing research projects.
- Capturing 100 videos per week, preprocessing, and segmenting for reconstruction inside a simulation, requiring deep understanding of system limitations and capabilities.

### University of Southern California, Robotic Embedded Systems Laboratory

Los Angeles, CA

#### Undergraduate Researcher

November 2024 – Present

- Working under the advisement of postdoctoral researcher Guangyao Shi to explore heuristics and optimization techniques for enhancing LLM-based task planning in robotic systems.
- Writing simple search algorithms including A\* to understand PDDL planners, improving knowledge of pathfinding and planning algorithms.
- Developing codebases to implement heuristics for VPR questions enabling more flexible and efficient planning with LLM chain-of-thought or DNN-based approaches.
- Implementing various VPR heuristic approaches from scratch to better understand the strengths and weaknesses of each method.

### University of Southern California, ICAROS Lab

Los Angeles, CA

#### Undergraduate Researcher

November 2024 – Aug 2025

- Collaborated with postdoctoral researchers to design and execute weekly human–robot interaction experiments, managing protocols from initial concept through implementation to streamline data collection and analysis.
- Wrote and optimized PDDL domain and problem definitions for the Overcooked environment in multiple agent settings; leveraged Llama 3.3 prompt engineering to iteratively refine 10+ functional planning scenarios.
- Built a comprehensive Python framework to facilitate systematic LLM chain-of-thought sanity checks, reducing integration errors and accelerating debugging cycles.
- Designed and integrated dynamic Neo4j knowledge graphs to support complex LLM planning, enhancing decision-making capabilities and improving query response times.

### University of Southern California, Takahashi Lab

Los Angeles, CA

#### Undergraduate Research Assistant

November 2023 – June 2024

- Collaborated with 4+ graduate students on quantum physics experiments, gaining expertise in quantum mechanics
- Developed a C++ program to calculate standard deviation for over 3000 N-V centers data, optimizing lab data analysis
- Utilized Mathematica to calculate detection volumes from research papers, enhancing experimental results

## PERSONAL PROJECTS

### miniPDDLSolver | GitHub

Python

- Developed a lightweight PDDL solver implementing A\* search algorithm to understand automated planning systems used in robotics task planning
- Engineered domain-independent parser for PDDL domain/problem files, generating valid action sequences through state-space exploration
- Implemented heuristic-based search with precondition validation and effect propagation for classical planning problems

### MuseumGeek Ticketing System | Course Project

Java, JSON, CSV, Threading

- Engineered a multi-threaded Java application simulating a museum exhibit ticketing system with dynamic ticket agents
- Implemented synchronized resource management using locks and semaphores to coordinate concurrent operations
- Developed a parser for JSON exhibit data and CSV transaction schedules with input validation and error handling

### **HandSignalCV | [GitHub](#)**

OpenCV, Mediapipe, Tensorflow

- Created ML system to detect and translate American Sign Language (ASL) into spoken sentences using OpenCV and Mediapipe
- Collected and processed a dataset of 5,200 hand gesture images to ensure accuracy across diverse users
- Trained a CNN with ReLU activation functions using Adam optimizer, achieving 99.5% accuracy and integrated Cohere API

### **YouTube Clone**

TypeScript, Firebase, Tailwind CSS

- Developed a fully functional YouTube clone using TypeScript and Vite, enabling users to upload, download, and stream videos through Firebase Storage.
- Implemented user authentication with OAuth, securely storing authentication data in Firebase Authentication.
- Designed a responsive and modern UI using Tailwind CSS, ensuring a seamless user experience across devices.
- Integrated real-time database updates for tracking video views, likes, and comments using Firebase Firestore.

### **College Professor Web Scraper | [GitHub](#)**

Python, PostgreSQL

- Built a Python-based web scraper using BeautifulSoup and Psycopg2 to compile professors' educational backgrounds
- Implemented PostgreSQL for robust data storage and retrieval, optimizing for large datasets using complex queries

## **SKILLS**

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**Languages:** Python, C/C++, HTML, CSS, Node.js, React.js, PostgreSQL, PDDL

**Developer Tools:** Git, Docker, Visual Studio, PyCharm

**Data Library:** NumPy, Pandas, Matplotlib, Scikit-learn, Tensorflow, Groq API, Cohere API, OpenCV, HDF5, Neo4j

**Awards:** USC Provost's Undergrad Research Fellowships, Engineering Mathematics Prize for outstanding performance in Calculus, J. Jayne Bissell Memorial Scholarship, Academic Achievement Award, Provost's Undergrad Research Fellowships, 4 x Dean's List