Kunal Pai

408-620-2339 | pai.kunal05@gmail.com | linkedin.com/in/kunpai | github.com/kunpai | kunpai.space

Education

M.S., Computer Science, University of California, Davis (GPA: **4.0/4.0**) Expected: June 2026

B.S., Computer Science & Engineering, University of California, Davis (GPA: **3.8/4.0**) June 2023

Relevant Skills

Languages: Python, C++, C, JavaScript, Java

ML/AI: TensorFlow, PyTorch, scikit-learn, LLMs, Prompt Engineering, Ollama, Hugging Face, Multi-agent Systems

Web/Data: React, Next.js, Django, Flask, MongoDB, pandas, NumPy, Matplotlib

Tools: Git, Docker, Unix/Linux, gem5, Jupyter, LLVM, Clang

Work Experience

Research Intern, *AIISC @ University of South Carolina* Jul 2025 – Present

- Onboarded to the Composite AI for Enterprise program, exploring integrations of neuro-symbolic reasoning and LLMs
- Developing early-stage ideas around culturally grounded reasoning, with a focus on Indian epistemologies and decision logic
- Collaborating with researchers on frameworks for enterprise knowledge graphs and hybrid agent architectures

Graduate Student Researcher, *DavSec Lab @ UC Davis* Apr 2025 – Present

- Built an automated pipeline for C-to-Rust transpilation using LLMs, targeting secure systems migration
- Identified Halstead vocabulary as the strongest metric for predicting translation difficulty
- Validated lightweight semantic augmentations (e.g., filename context) that improved functional accuracy by 5%
- Benchmarked state-of-the-art LLMs across 746 C/C++ programs, achieving 70.2% functional accuracy with best prompt design

Graduate Student Researcher, *DECAL Lab @ UC Davis* Sept 2022 – Dec 2024

- Developed a 2,250-sample dataset for pairwise code-documentation alignment from 200 open-source Python projects, enabling future research in software maintenance
- Engineered a pipeline for measuring calibration and correctness of large language models for code repair, using Defects4J
- Collaborated in validating efficacy of semantic augmentation of language model prompts for code summarization using precision and recall metrics like ROUGE and METEOR

Publications (Selected)

CoDocBench: A Dataset for Code-Documentation Alignment in Software Maintenance, Pai, K., Devanbu, P. & Ahmed, T., *Mining Software Repositories (MSR) 2025: Data and Tool Showcase Track*

Calibration and Correctness of Language Models for Code, Spiess, C., Gros, D., Pai, K., et. al., *International Conference on Software Engineering (ICSE) 2025*

Automatic Semantic Augmentation of Language Model Prompts (for Code Summarization), Ahmed, T., Pai, K., Devanbu, P. & Barr, E. T., *International Conference on Software Engineering (ICSE) 2024*

Project Experience

HASHIRU: Hierarchical, Resource-Aware Multi-Agent Framework March 2025 – Present

Entrepreneurial Research Venture *Python, LLMs, Multi-Agent Systems*

- Designed and deployed a multi-agent architecture enabling dynamic, LLM-driven collaboration across diverse tasks
- Implemented task decomposition with intelligent agent delegation based on resource cost models and task specialization
- Engineered autonomous generation of tools and APIs for task execution
- Developed a robust evaluation framework for agent performance across complex, multi-step tasks

gem5 Vision Jan 2023 – Jun 2023

Resource Discovery Framework *Next.js, Python, MongoDB, JSON Schema*

- Accelerated resource discovery 20× for 1,200+ gem5 artifacts by optimizing search and categorization logic
- Implemented categorization and semantic versioning across 20+ resource types to streamline retrieval
- Integrated local and remote JSON schemas with MongoDB, improving accessibility for 500+ users