Sep Nasiriany

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EDUCATION

Computer Science, Bachelors of Science | University of California, Santa Cruz | Oct 2020 - Dec 2024

EXPERIENCE

Baskin Engineering Tutor | University of California, Santa Cruz | Apr 2024 - Dec 2024

I helped students enrolled in CSE13s (Computer Systems and C Programming) understand essential C programming skills such as memory management, algorithm design, data types, debugging, and program development.

Robot Perception and Learning Lab (RPL) Researcher | University of Texas, Austin | Jan 2025 - Present

- Contributed to RoboCasa365, a large-scale robotic simulation benchmark featuring 365 diverse household manipulation tasks spread across 2,500 procedurally varied kitchen environments.
- Designed and implemented rich, realistic task scenarios using a structured task-generation pipeline, enabling evaluation of generalist robot policies under large variations in objects, layouts, and scene styles.
- Supported experiments on pretraining, finetuning, and lifelong learning for state-of-the-art robotic manipulation models (e.g., Diffusion Policy, $\pi_0/\pi_{0.5}$, GROOT), contributing to large-scale benchmarking of generalist robot learning.
- Conducted real-world robot experiments and built the full GR00T evaluation and co-training pipeline, including a custom VLA-mapping script, low-latency GR00T inference setup, and an end-to-end system for integrating simulation and real-robot demonstrations to train and evaluate generalist robot policies.

PROJECTS

RSA Encryption

- · Implemented a public-key cryptography system using the Schmidt-Samoa (SS) algorithm, incorporating key generation, encryption, and decryption functionalities.
- · Developed number-theoretic functions, including modular exponentiation, primality testing, and modular inverses, ensuring secure key pair generation.
- · Utilized the GNU Multiple Precision Arithmetic (GMP) library to handle large integer computations necessary for secure cryptographic operations.

Compression/Decompression Algorithm

- · Implemented Compression/Decompression using Lempel-Ziv algorithm
- $\boldsymbol{\cdot}$ Created an encoding and decoding system that converts repeated text patterns into short symbols
- · Utilized bit manipulation, dynamic memory allocation, and file I/O to create encoder and decoder.

Optical Image Recognition (OCR)

- · Leveraged multimodal AI with a vision-language model (Llava-1.5-7B) for text and mathematical symbol recognition, utilizing transformer-based architecture for sequence generation.
- $\cdot \ \text{Implemented image preprocessing techniques to enhance character recognition accuracy}.$
- $\cdot \ \, \text{Utilized prompt engineering and fine-tuned the model for improved performance in complex equation interpretation}.$
- · Integrated the OCR system with dataset handling and automated evaluation for efficient validation.

Multithreaded HTTP Server

- · Optimized server efficiency with a thread-pool model, improving throughput while maintaining request coherency and avoiding unnecessary blocking.
- Developed a thread-safe queue and synchronization mechanisms using mutexes and condition variables to ensure efficient request processing and correctness
- $\cdot \ Implemented \ an \ audit \ logging \ system \ that \ maintains \ a \ linearizable \ order \ of \ client \ requests, ensuring \ atomicity \ and \ durability \ of \ log \ entries.$

Unengine ROM Emulator

- · Developed a C++ emulator for a fictional Banana video game console, accurately executing Slug ROM files.
- · Designed and implemented core emulator components, including CPU instruction decoding, memory management, and GPU rendering using SDL2.
- · Integrated unit testing with Google Test and automated CI/CD pipelines using GitHub Actions to ensure code reliability and maintainability.

SKILLS

Programming languages: Python, C, C++, Java, Assembly, Haskell

Machine Learning & Robot Learning: Deep Learning, Reinforcement Learning, Vision-Language-Action (VLA) models, Diffusion Policy / Diffusion Models, Model fine-tuning (LoRA, supervised finetuning), Dataset generation & curation, Custom Dataloaders, Experiment design & ablation studies

Robotics & Control: Real-world robot manipulation, Robot perception, Sim-to-real transfer, Teleoperation, Robot calibration / environment setup

 $\textbf{Research Interests:} \ \text{Reinforcement learning, Sim-to-real transfer, Generalist robotic policies, Multimodal policy learning} \\$