Jay Darshan Vakil

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SKILLS

Software/Frameworks: Python, Java, JavaScript, C++, Assembly 68k, MATLAB, Git, Linux, Pytorch, TensorFlow, ROS (Robot Operating System), AWS S3, OpenCV, Object-Oriented Programming.

Hardware: Circuit Simulation, Signal processing, Digital/Analog circuit design and simulation, Microprocessors, Embedded systems, Circuit testing, Transistor-level design, CAD, Systems on Chip (SoC), Electrical circuit testing, PCB design and testing.

EDUCATION

University of Washington | Bachelor of Science in Electrical Engineering Sept. 2018 - Mar. 2022

- Minor in Computer Science and Math
- Courses: Object-Oriented programming with Java, Software Engineering, Data structures and algorithm, Linear/discrete signal processing, Microprocessor system design, AC/DC circuit analysis, Digital circuit analysis, Electrodynamics, Transistors and amplifiers, Electrical testing, Biomedical instrumentation.

EXPERIENCE

Robotic System Integrator | Insight Global @ Facebook AI Research lab | Pittsburgh, PA & Fremont, CA
Apr. 2022 -

- Built a large-scale distributed robot arm cluster for running experiments and autonomous/human data collection in parallel. Collected and released one of the largest robotics dataset with over 70,000 demonstrations collected from various sources.
- Designed and developed software tools that reduced the downtime of systems and experiments by 90% and increased efficiency by 35%. Engineered LDAP-like tools to create user accounts and account native code and data storage systems.
- Streamlined an automated pipeline to move data collected daily to an AWS S3 bucket via EC2 instance from local storage. Moved over 5 TB of data till now with a 95% success rate.
- Researched a universal agent that can efficiently solve 12 non-trivial skills over 38 different tasks with a success rate of over 75%, using semantic augmentation and in-model painting to multiply data, thus, requiring less real data to train. The agent could generalize over 100 unseen scenes. The agent is based on a language-conditioned multi-task offline imitation learning framework. The research was featured in multiple media sources such as IEEE Spectrum, ACM, TechCrunch, etc. Check out the project here: robopen.github.io

Engineering Project Lead | STI Optronics | Seattle, WA Sept. 2021 - Mar. 2022

- Oversaw a team of engineers to design a state-of-the-art master controller for a high-energy electron source for a particle accelerator. Researched applying two methods, Arduino and National Instrument I/O modules, to solve the problem of operating a complex system remotely. Built both ways to test the reliability and effectiveness, the results were within +/- 5%, measuring the signals up to 90% accurate and sending signals to power the equipment within 5 seconds.
- Built a digital-to-analog converter using an MCP4725 chip and designed a low-level bit convertor in LabVIEW to convert an Arduino's digital signal to analog to read/write from National Instrument modules.

PUBLICATIONS

- Towards Sample Efficient Robot Manipulation with Semantic Augmentations and Action Chunking. (2023). Homanga Bharadhwaj, **Jay Vakil**, Mohit Sharma, Abhinav Gupta, Shubham Tulsiani, Vikash Kumar. robopen.github.io
- Spatial-Language Attention Policies for Efficient Robot Learning. (2023). Priyam Parashar, Vidhi Jain, Xiaohan Zhang, **Jay Vakil**, Sam Powers, Yonatan Bisk, & Chris Paxton. roboslap.github.io