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Charlie Yan

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## EXPERIENCE

### Software Engineer V, Meta Platforms

Fremont, CA, April 2023—Present

- Integrated ROS2 Navigation2 and Moveit2 components for pose graph SLAM, particle filter based localization, wavefront based global planning, and DWB, TEB, and MPPI local planners. Tuned parameters to optimize performance and delivered robotics software stack sufficient for cycle testing ahead of schedule.
- Developed LIDAR driver, integrated MIT Cheetah motor (Steadywin) Cyphal driver for differential drive mobile base. Part of transitioning off mecanum motors to use one motor model for arm and base. Designed, implemented, tested, and delivered automated docking state-space controller and related support software.
- Developed custom C++ software for keep-out zones for robot planning, behavior trees in ROS2 using pytree and integration software with Meta's backend.

### Simulation Engineer, (NASA ARC)

Mountain View, CA, July 2020—2023

- Worked with VIPER Rover software and flight software teams on Gazebo9 simulation (models, URDF, plugins) to simulate VIPER rover lander egress from Astrobotic lander CAD (Meshlab decimation and reducing complexity), similar for TRIDENT drill / AIM camera operations
- Developed, tested, and delivered UDP server / client components to pull and cache science data (ice depth, surface temperature) tiff tiles from mapserver based on ROS2 rover ground truth, to feed to UDP flight-software components and support fault injection. Integrated science payload and ground system simulation software in a development lab as well as in the flight-forward Multi-Mission Operations Center (MMOC)
- Implemented, tested and delivered dev-ops tools, including a web dashboard to stand up the entire simulation software stack and initialize the rover and flight software on the simulated lunar environment for weekly software integration / user-acceptance testing events. Supported flight-like simulation training activities SIM1-SIM5 involving a variety of science, engineering, operations VIPER teams in the MMOC

### Lead Software Engineer, Pneubotics / Canvas

San Francisco, CA, Apr 2016—May 2019

- Software and architecture
- Path planning and algorithms
- Computational geometry
- Kinematic, trajectories, estimation, optimization
- Machine vision: LIDAR, RGB, sensor fusion, motion capture ground truth
- Hardware shakeout and testing, safety and fault management, feedback control tuning

### Software Development Engineer, Amazon.com

May 2013—Dec 2015

- Designed, implemented, and shipped a new Java Spring service for ingesting data about billions in cash transactions per day to an accounting platform using DynamoDB, SQS/SNS, and S3 AWS services. Migrated all global traffic to use new service on schedule, using automation and scripting to detect and fix regressions before they impacted production. Reduced monthly operational tickets by 15% with a service.
- Worked with technical and business teams to onboard new international businesses and new payment use cases onto our platform. Increased global automated accounting coverage from 85% to 92%.
- Refactored all services to be fully configuration-driven, vastly reducing developer effort needed to onboard new businesses and accelerating efforts to reach 100% automated accounting.

## EDUCATION

University of California, Santa Cruz College of Engineering — Robotics M.S. Thesis

Graduated June-2023, GPA 4.0

- Numerical Linear Algebra, Nonlinear Control, Convex Optimization, Feedback Control, Bio-inspired robotics
- First author on Arxiv 2304.00595, third author on conference paper under Professor Abhishek Halder
- Thesis in Euler-Equation Optimal Mass Transport, Tensorflow v2 & Pytorch PINN deep-learning systems of PDEs