# LIAM CHALK

(202) 213-7959 ◇ liamchalk00@gmail.com ◇ liamchalk00.github.io

## PROFESSIONAL SUMMARY

**FPGA and Computer Engineer**

Experienced in hardware and software system design for high frequency and reliability. Using VHDL, SystemVerilog, TCL, and Python for hardware debugging, test case coverage, and performance modeling.

## EDUCATION

**Harvey Mudd College Computer Engineering Major** 2019 - 2023

Relevant Coursework: System on Chip Design, Digital Electronics, Computer Engineering, Electronic Circuits, Analog Electronics, Systems Engineering, Operations Research, State Estimation, Rocketry, Computer Vision, Continuum Mechanics, Materials Engineering, Experimental Engineering, Manufacturing Engineering

## TECHNICAL EXPERIENCE

**TrellisWare Technologies Digital Design Engineer** August 2023 - Present

- Designing FPGA functionality for tactical radio RF signal processing for specialized waveforms
- Writing VHDL and running simulations in ModelSim and Vivado

**FTS International FPGA Engineer** Summer 2022

- FPGA design for high frequency software defined radio signal processing for use on satellites
- Developed filtering and analysis techniques in Verilog and integrated within Python pre and post processing

**Silvus Technologies Neural Network Clinic Software Engineer** Fall - Spring 2023

- Created a neural network to localize radio frequency signal origin and environment mapping using GPS, IMU, LiDAR, compass, and altimeter drone data collection
- Led a team of five students using Pytorch to train the model and test performance

**Doosan Bobcat Autonomous Vehicle Clinic Software Engineer** Fall 2021

- Designed a novel C++ simultaneous localization and mapping algorithm for autonomous driving
- Patent: "Path Planning for Automatic Mowers" (WO 205244)
- Autonomously covered the mowing area for a lawnmower using state estimation and path optimization

## PROJECTS

**Core-V Wally Contributor** Spring 2023

- Developed C and assembly language coverage tests for a SystemVerilog RISC-V 5-stage pipelined processor
- Contributed to open source tests for PMPCFG and PMPADDR coverage for Privilege, IFU, and LSU units

**Backtesting for Trading Strategies Platform** Spring 2024

- Created a platform for users to test Python and C++ algorithmic trading strategies against historical data
- Hosted on AWS with Django fullstack and Python backend

**Computer Vision Object Reconstruction** Spring 2023

- Created 3D reconstructed models in Python using object masking, SIFT keypoint detection, and point clouds

**Coronavirus Mutation Tracking** Spring 2021

- Identified mutations in coronavirus DNA and constructed a evolution tree over time using Python

## SKILLS

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| **FPGA Design** | VHDL, SystemVerilog, Xilinx Vivado, ModelSim, Zynq APSoC, ARM, and RISC-V |
| **Programming** | Python, C, C++, Java, HTML, Git, PyTorch, OpenCV, Django, React, TCL, AWS |
| **FPGA Filters** | Particle Filter, Extended Kalman Filter, Autocorrelation Filter, Moving Average Filter |
| **Software** | Linux, MATLAB, SolidWorks CAD, Autodesk CAD, AMPL, COMSOL, Simulink, Segger |
| **Hardware** | Digital Circuitry, Arduino, Radar, GPS, IMU, Magnetometer, Controller Area Network |