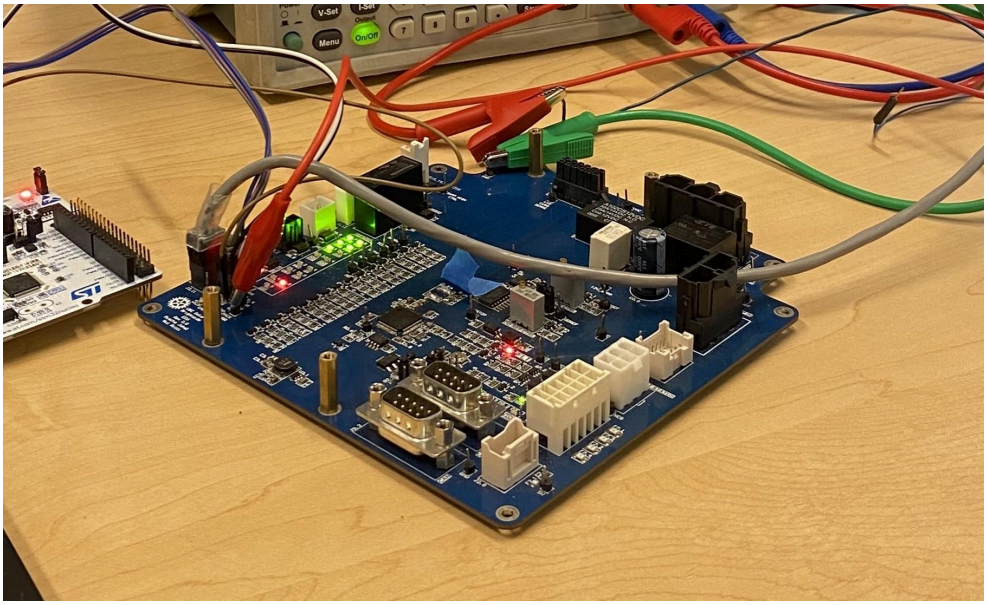
## STM32 Projects & Blog Posts

IWDG & RCC_CSR Blog post:
https://ckalitin.github.io/technical/2025/03/26/stm32-rcc-register.html
Automated ADC Characterization:
https://ckalitin.github.io/projects/2024/12/29/scpi-auto-characterization.html

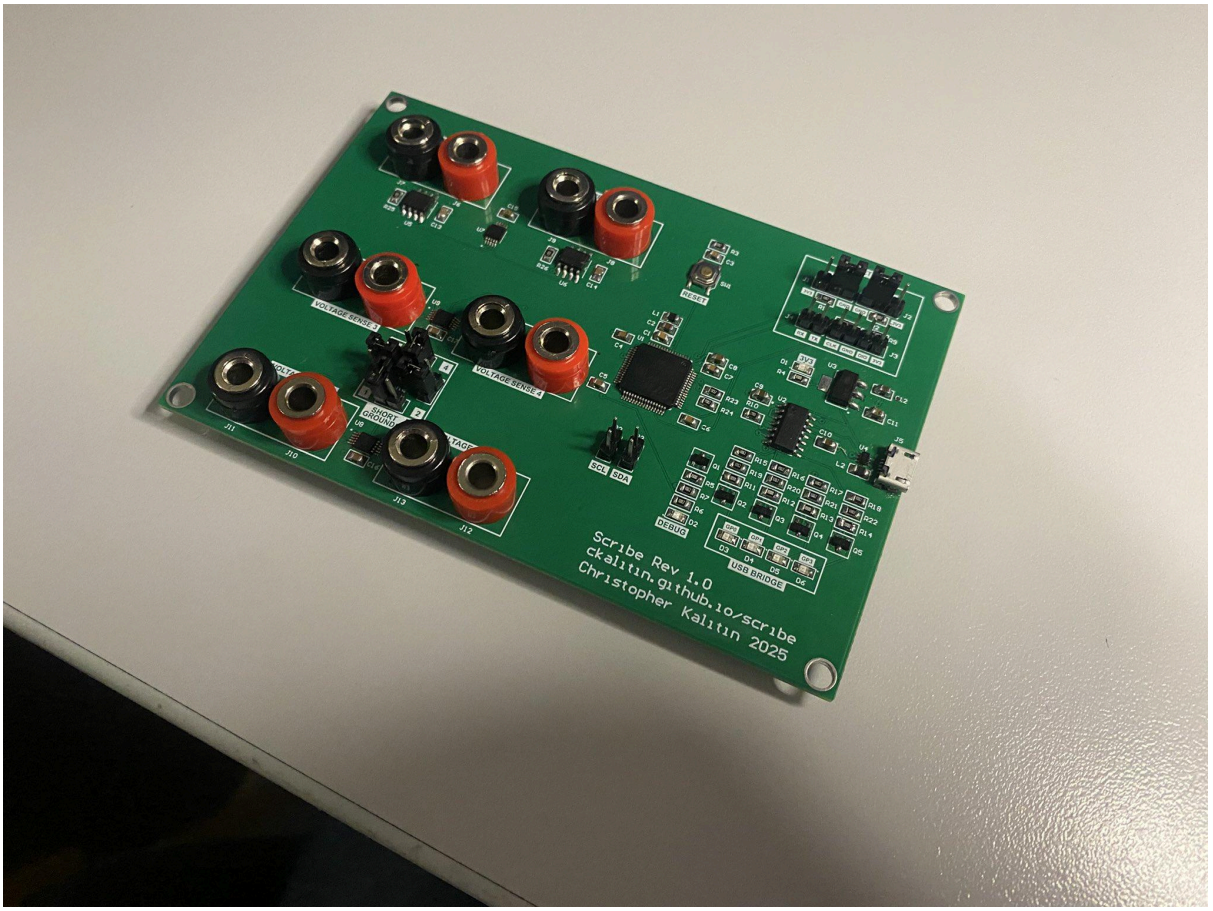
In 2024 I joined the UBC Solar student design team on the Battery Management System subteam. Most of my work involved programming, and characterizing STM32 microcontrollers. This involved debugging Independent Watchdog errors (which required diving deep into how STM32s really work), characterizing the ADCs, and more development/programming tasks.



## PCB Design

For UBC Solar projects I taught myself PCB Design and designed a PCB based on the STM32 to record time series voltage and current data for easy characterization of various systems (eg. current sensor). Essentially an easily programmable multimeter & oscilloscope.

Currently doing this project, here's the current state of the PCB with firmware here:

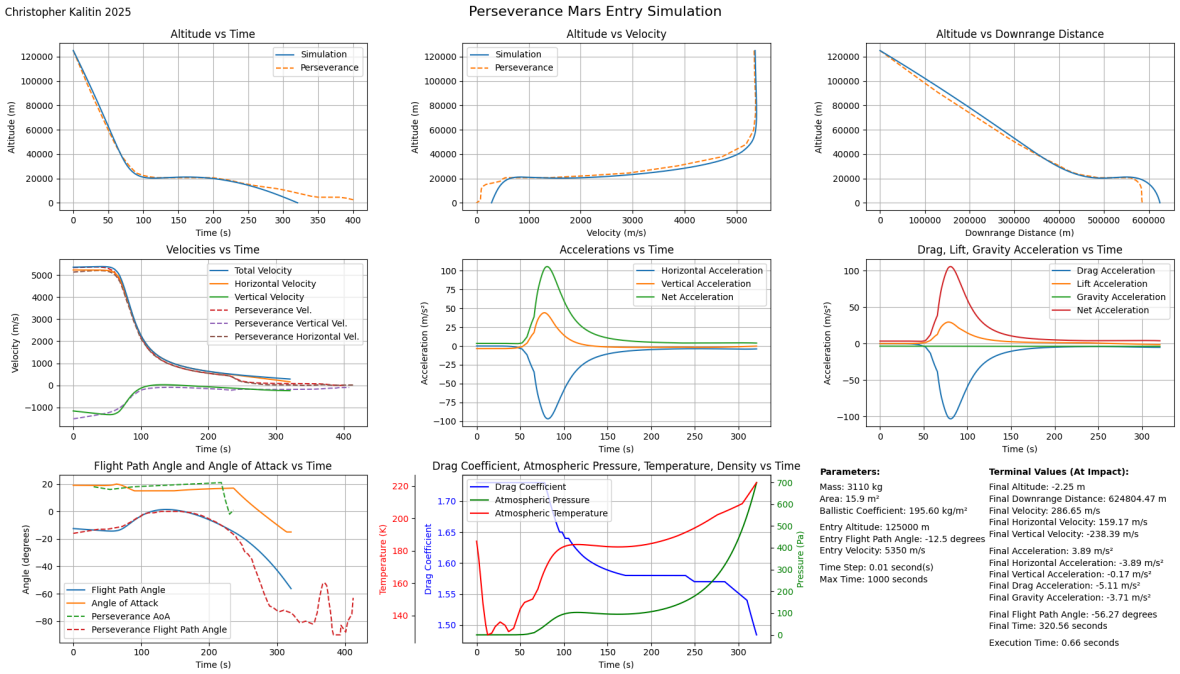



## Python Data Analysis & Simulation Projects

McDowell Dataset Analysis: https://github.com/CKalitin/mcdowell-dataset-analysis
Martian Ballistic Modelling:
https://ckalitin.github.io/space/2025/05/13/martian-atmosphere-model.html

I wrote a python library (that's on PIP!) to analyze Jonathan McDowell's dataset of every launch that's ever occurred and every object to ever be intentionally put into space. He gives raw .tsv files and I wrote a more user friendly Python package.

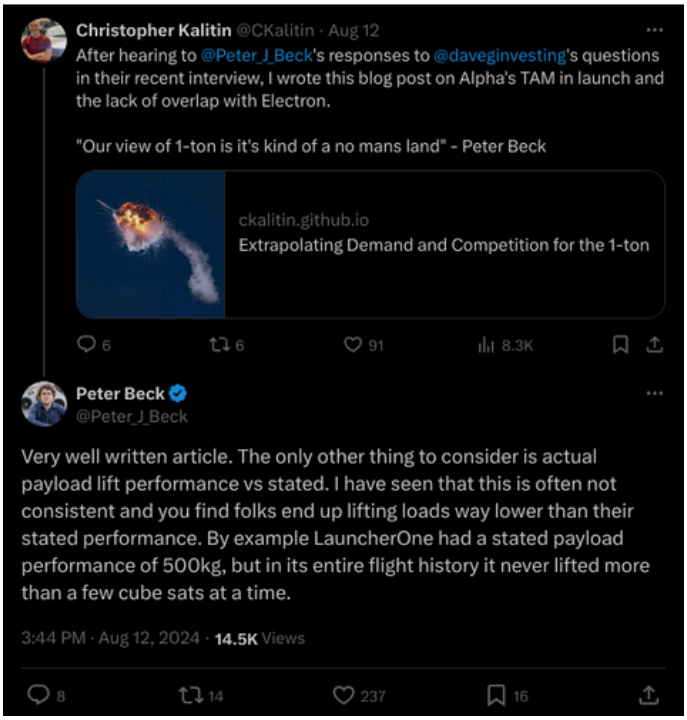
I also wrote a simulation of blunt body entry vehicles descending through Mars' atmosphere:




# Analysis of the Commercial Satellite Launch Market

https://ckalitin.github.io/space/2024/08/12/extrapolating-demand-firefly.html
https://x.com/Peter_J_Beck/status/1823128548581994792

As part of my demand analysis of the commercial small satellite launch market I wrote 10+ blog posts. The most successful of these was read by Peter Beck, the CEO of Rocket Lab!

# Unity Development

https://github.com/CKalitin/Unity-Simple-Networking-Layer
https://github.com/CKalitin/Simple-Hex-Strategy-Game

My final project in my Digipen Game Development class was an online multiplayer platformer called Stuck in the Simulation. After finishing this project I was familiar enough with C# Unity Networking programming that I decided to create a high-level Unity Package for networking. This abstracted away many of the intricacies of networking so that the user had an easier experience creating a game. At the end it was 8,000 lines of code and I implemented it in a game myself called Tiny Troops (second link).


*I'm no artist, excuse the extreme adherence to low poly art in this early build of the game.*