



Product Development Intern Drone Tech

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Agenda

- Problem Statement
 - Objective
- Methodology
 - Result
- Conclusion



Problem Statement





Drone tech, being a fairly new technology, has still not adopted any widely used **benchmarking** system. This is still being worked upon worldwide.





Propulsion Testing Rig: Objective

The objective is to collect necessary data from motors, propellers, ESCs and batteries. This rig [PROPULSION TESTING RIG] will collect real time data such as thrust, voltage, current, power, pwm and temperatures.



Methodology

01

Literature Review:
RCBenchmark's
test stand and
NASA's research

02

Design and
Analysis of the
mechanism

03

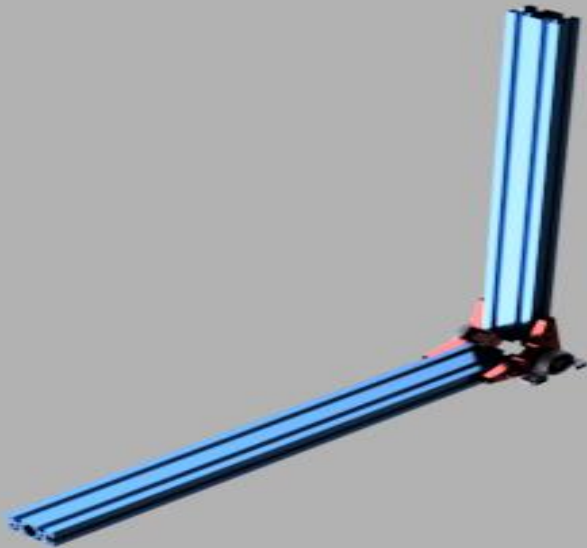
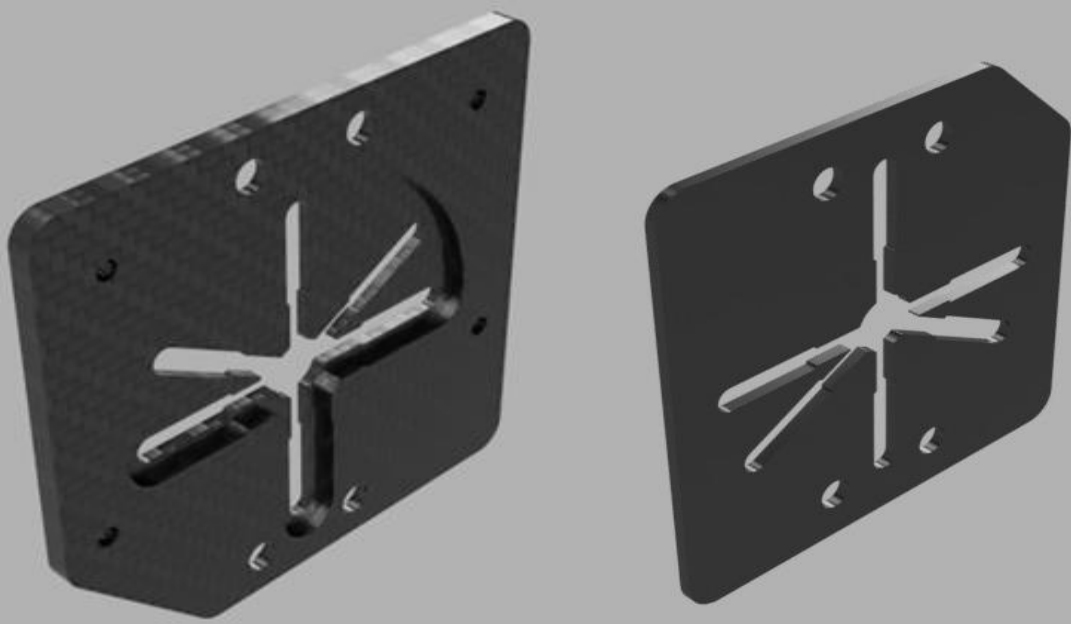
Raspberry Pi,
Sensors
Integration and
Electronic
Connections

04

Software system
for collecting data
and also make a
GUI for user
(python)

05

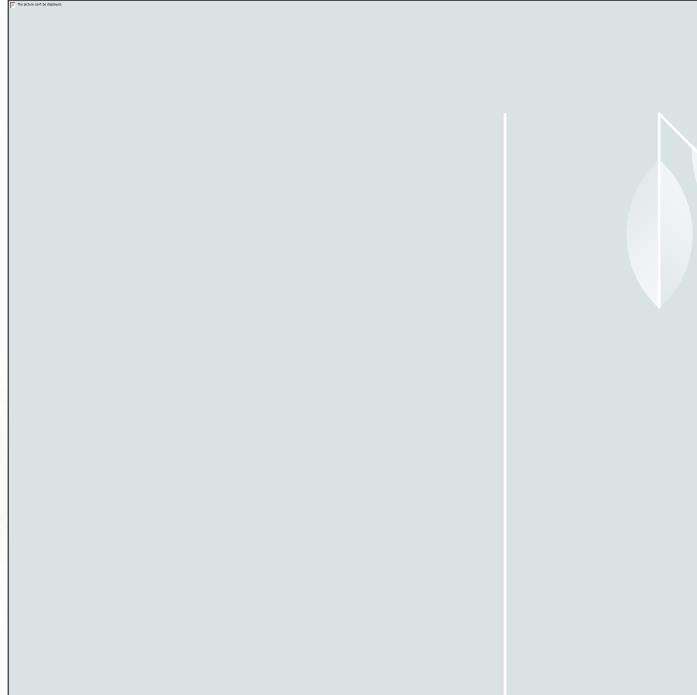
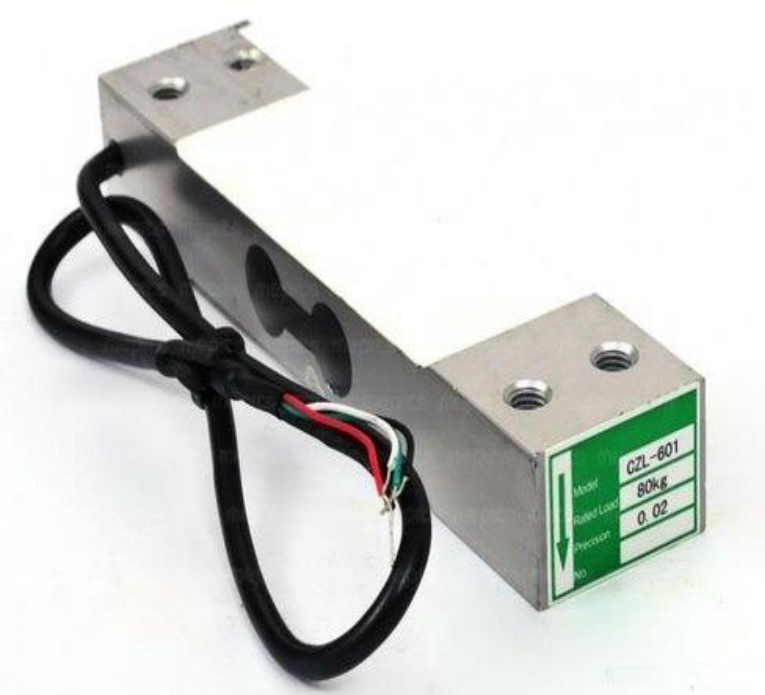
Data visualization
using seaborn
and pandas
(python libraries)



Designs for thrust mechanism and mounting

Used Fusion360

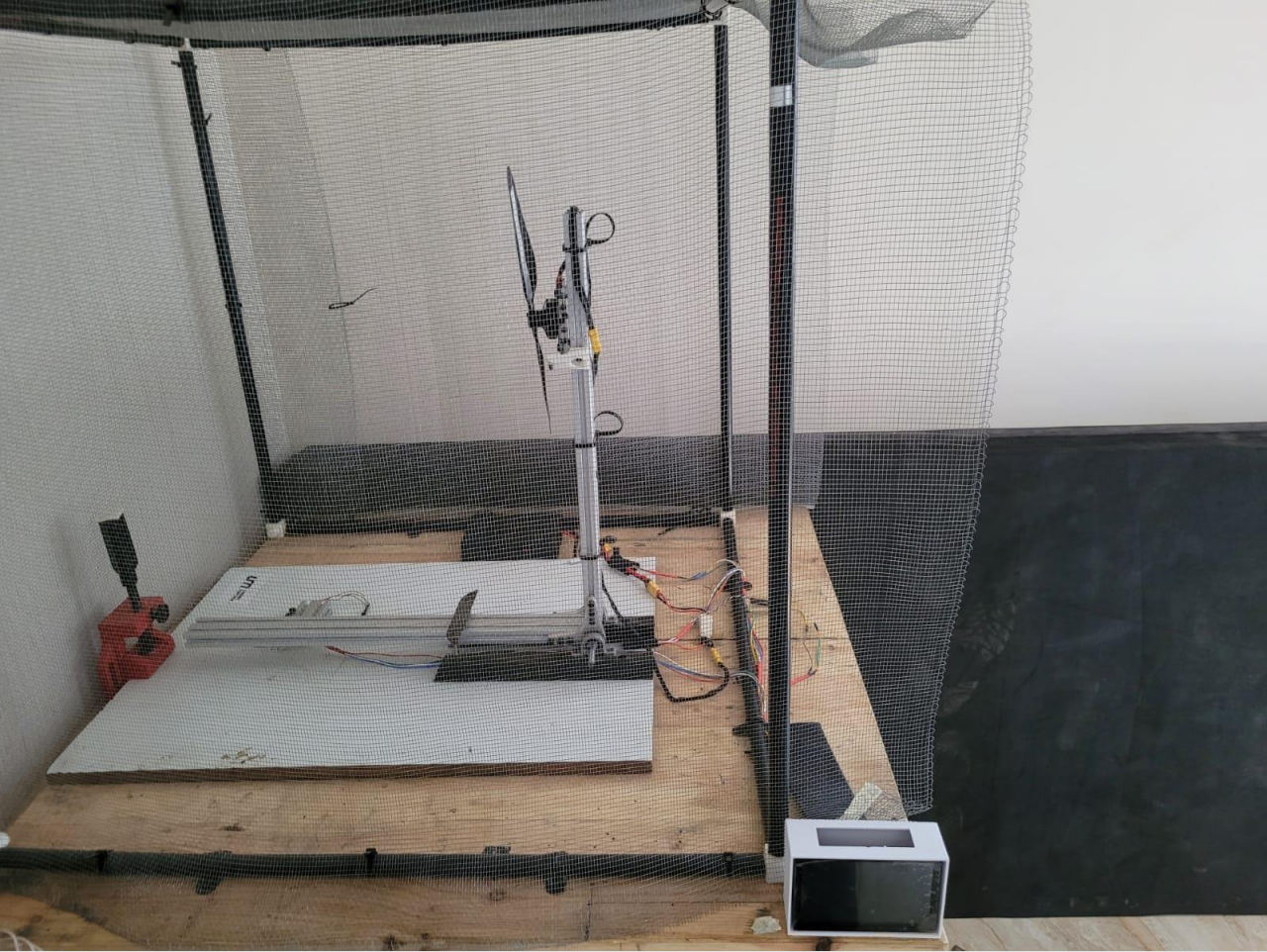
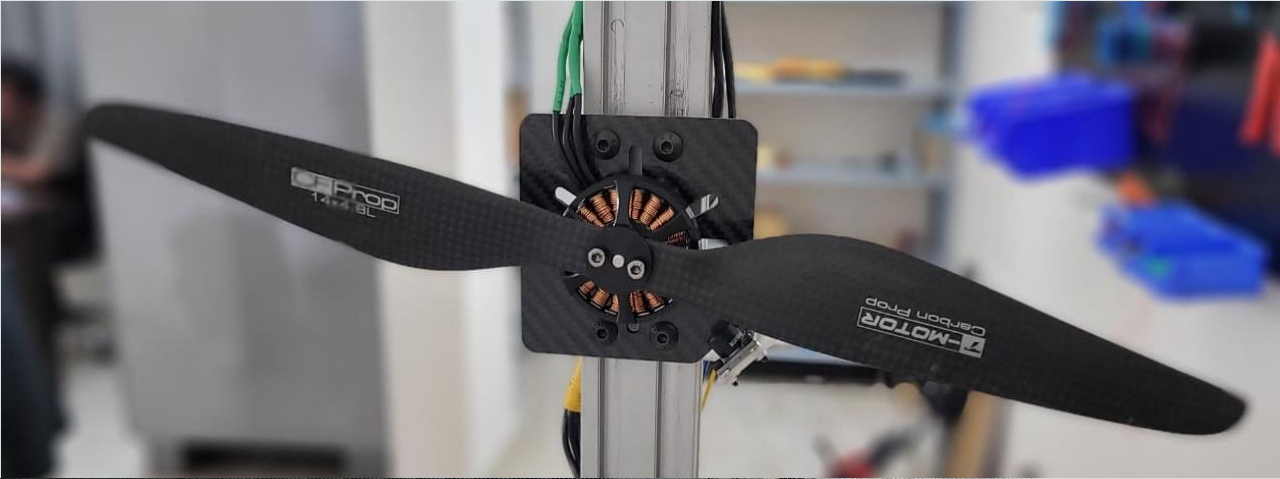




Sensors Integrated

Used Python, GoLang, C++ with
Raspberry Pi

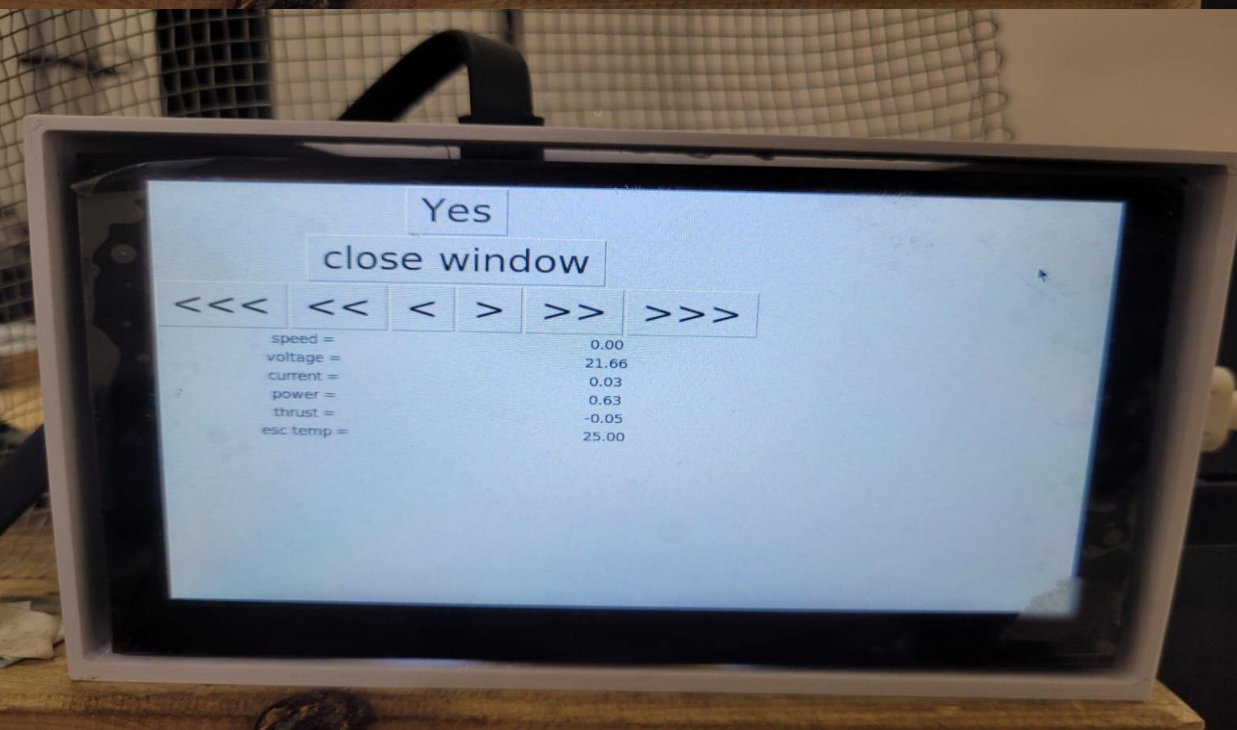
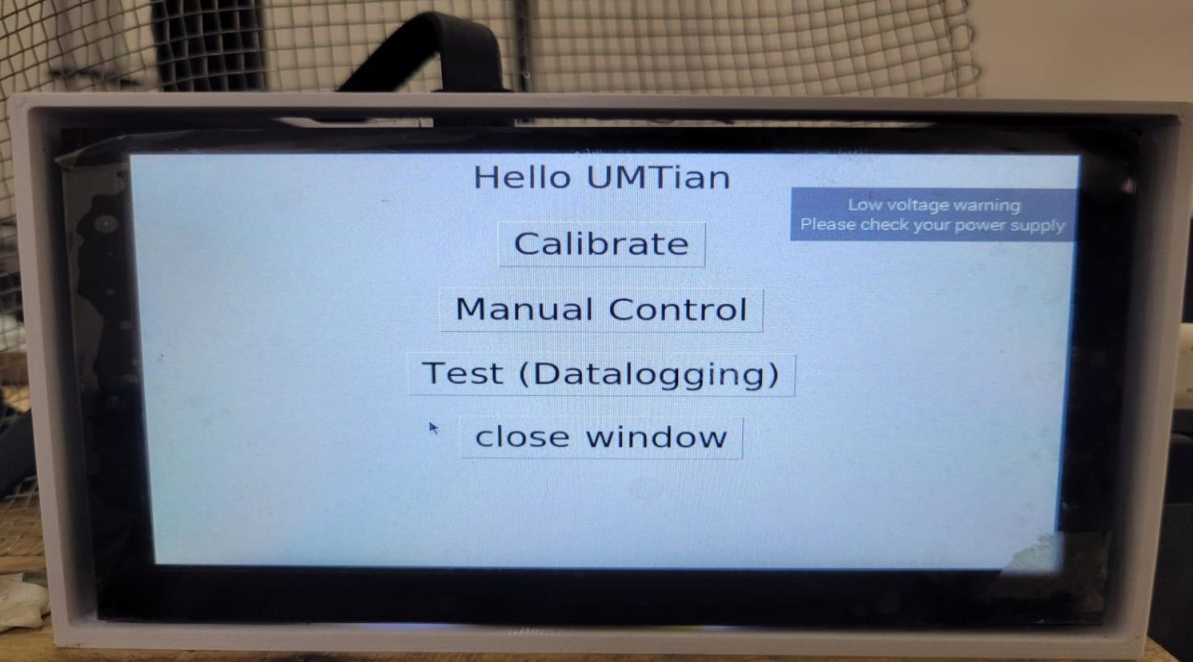




Fabricated

Used 3D Printing and CNC
Machining





Ease of Use

GUI developed using tkinter library
which also makes a log file for every
test



Results



DATA COLLECTED

- Thrust
- Voltage
- Current
- Power
- Pwm -> Throttle %
- Motor temperature

SAMPLE ANALYSIS

- Made performance comparisons between 6s Lipo, 6s Li-ion and 7s Li-ion batteries
- Thrust-Current Plot
- Thrust-Throttle Plot
- Thrust-Power Plot
- Voltage-Current Plot
- Power-Throttle Plot

Results (continued)

LOG FILES

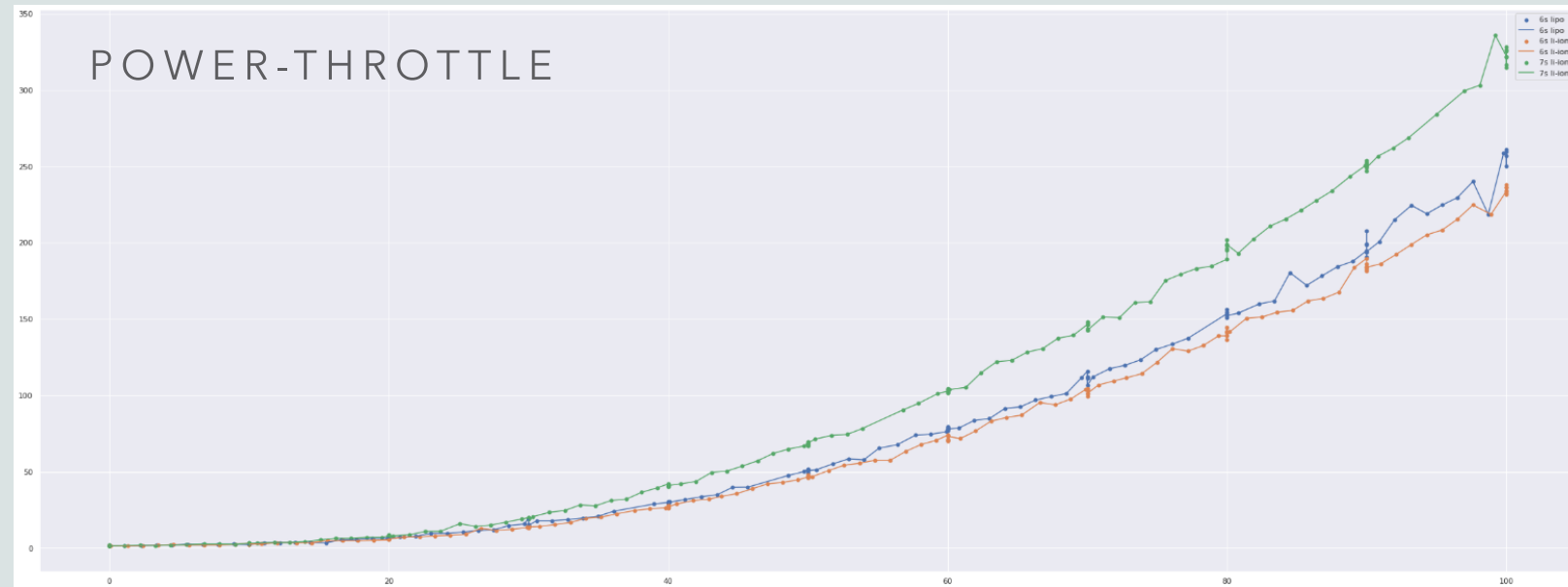
- json format
- Conversion to data frame using pandas
- Visualization of data using matplotlib

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Results (continued)

COLOR CODE

- blue: 6s LiPo
- orange: 6s Li-ion
- green: 7s Li-ion





Conclusion

The first iteration (basic functionality) of this project is done and now, further improvisations can be made to benchmark even more efficiently.

THANK YOU