



Rocket Flight Computer Hardware-in-the-Loop Testing System

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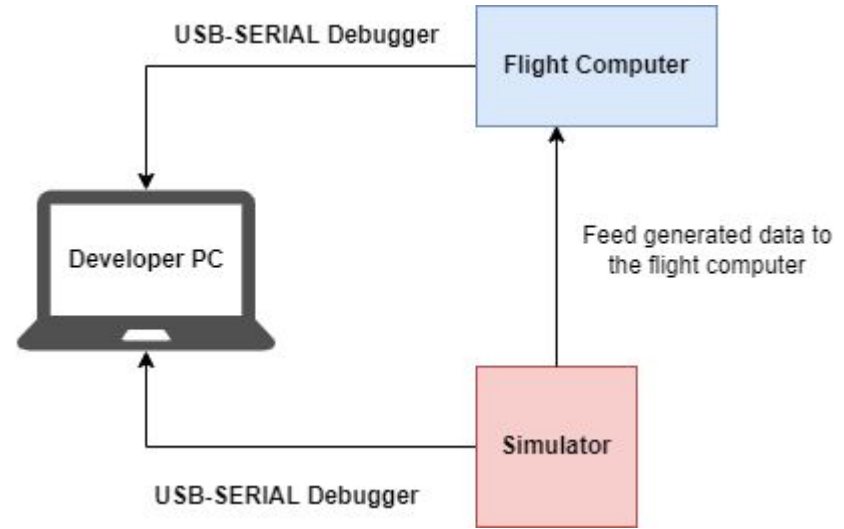
Problem Statement

1. Lack of a well defined testing mechanism for the flight hardware and software during development
2. Sparsely placed drone testing leading to inadequate test time



Proposed Solution - Hardware-in-the-loop testing

1. Build a 'clone' flight computer that mimics the flight data and feeds this into the actual flight computer
2. Aim - trick the flight computer to think it is flying
3. Debug this over a desktop application
4. Desktop app helps to view the flight states and how the software is making its decisions
5. Help pinpoint the logic problems and errors pre-flight



Proposed solution - Flight computer test bed

1. Develop a vibration test bed to test **how the flight computer behaves under vibration**
2. Test how the flight computer behaves under various angular orientations while under vibration





Objectives

1. To develop a HIL system model with a controller and plant under test
2. To develop a clone flight computer that mimics the actual flight computer that will fly
3. To design and develop robust and error-free flight software capable of achieving mission goals
4. To design and develop a vibration test bed for the avionics hardware
5. To design and develop a desktop app to be used specifically for flight computer testing



Conclusion and Benefit

1. We are certain that the HIL test system will ensure we develop and build rocket avionics that are resilient to erroneous behaviour, even though actual launch events cannot be predicted fully.

We believe this will be a critical addition to overall Nakuja Project!