Unmanned Aerial Vehicles (UAVs) can be used for aerial mapping, surveillance, atmospheric observation, communication relays, search and rescue and natural disaster response. Many of these tasks would benefit from the ongoing or even persistent presence of a UAV, or one with a practically limitless range.

Aircraft have the ability to harvest solar and wind energy during flight to give them more speed, altitude or stored electrical energy. By managing these energies and balancing resources against mission objectives, aircraft can benefit from substantially increased performance and the possibility of persistent flight.

This research will focus on demonstrating that the most efficient behavior for a fixed wing aircraft is not necessarily a straight line.

Asity - Custom Avionics

Asity is an avionics platform built specifically for small, high performance aircraft. It contains a complete sensor suite to gather data about the aircraft's attitude and position as well as monitor energy consumption of the control surfaces and motor.

At only 40x60 mm in size, Asity has been designed to fit into the cramped narrow fuselage of efficient, scale gliders, while still containing all components required to operate and communicate with an autonomous UAV.

Asity features a Field Programmable Gate Array (FPGA) as its main processor instead of a more conventional CPU/Micro-Processor. This allows for the separation of software components that can run completely in parallel providing greater reliability and potentially more processing power.

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