Drone SOC Capstone Project
Project Deliverables and Timeline
Revised: February 9, 2017
Lattice Semiconductor
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Project Deliverables

The capstone team has been tasked to replace the microcontroller-based flight controller in the Cheerson CX-20 drone platform with a Lattice FPGA, and write the software necessary for basic flight control. Basic flight in the context of this project has been defined as the ability to take off, hover, and land the drone. Control of the drone shall be by remote. No automation features or complex sensors are necessary; the drone can be controlled completely manually. The drone must appear as a finished product, which has been defined as not having visible tape, wires, etc.

Lattice to provide (per the project description provided by Lattice):

- Cheerson CX-20 drone (*received February 2, 2017*)
- FPGA device samples
- Lattice MachXO2 FPGA dev. boards (*received 2 FPGAs in early January*)
- Software for programming FPGAs (Lattice Diamond)
- Funding for miscellaneous extras as needed
- An engineer to monitor project and answer questions

Project Timeline:

Winter Term (*January 9, 2017 – March 25, 2017*)

- Select and procure drone for project
- Manual test flight of drone; document stock flight parameters
- Characterize drone input and output signals
- Implement simple FPGA motor control scheme and test
- Design translation protocol for remote receiver input to FPGA and test
- Begin work on system integration and programming

Spring Term (*April 3, 2017 – June 17, 2017*)

- Finalize drone control scheme
- Integrate systems and program FPGA
- Main project deliverable (operational drone) tentative deadline: ***May 15, 2017***
- Project documentation: user guide, BOM, schematics, RTL diagram
- Project presentation and reports