**Project Proposal**

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| **Student Name:** | Caleb Oviedo-Blomquist |

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| **Project Title:** | Canard-Based Rocket Roll Control System |

**Project Description:** *Briefly describe your objective using non-technical terms. Example: “I will make a coffee bean roaster by adding a microcontroller, temperature sensors, and a solid-state AC switch to an off-the-shelf consumer-grade popcorn maker.”*

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| I plan to make a roll control system using canards, a microcontroller, stepper motor, Inertial Measurement Unit, and 3 axis gyroscope. |

**Diagram**: Include a diagram schematically depicting your system. A circuit diagram of how the components will be connected is the best.

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| **C**  **B**  **D**  **A**   1. 12 V Stepper Motor Connected to a gearing system for canard control 2. Stepper driver (One depicted not one to be used) 3. 6-Axis Gyro and Accelerometer 4. 9-DOF Inertial Measurement Unit |

**Sensors/Inputs*:*** *List the sensors you will use. Include the quantity to be sensed and the type of signal. Choose a name for the sensed signal. Example: “Temperature sensor: Resistance Temperature Detector (RTD): Analog voltage 0–5 V: Temp1.” If you are still looking for some important information, say so.*

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| Adafruit 9-DOF Inertial Measurement Unit: Digital I2C Connection, Angular velocity Vector and Linear Acceleration vector  6-Axis Accelerometer and Gyroscope: Digital I2C Connection, linear acceleration and angular position |

**Actuators/Outputs:** *List the actuators you will use. Include the type of actuation and the form of the actuation signal, including voltage, current, and power requirements. Choose a name for the actuation signal. Example: “D/C motor: DeWalt brushed d/c motor: 24 VDC/250 A/1100 W: Motor1.” If you are still looking for some important information, say so.*

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| Sparkfun Pro Stepper Driver: Digital Control for stepper motor  Stepper Motor: 12 V, 1.8deg/step  Canards: 3D printed gear train to stepper motor |

**Functionality:** *Show how your system will handle inputs and outputs with a flowchart or other schematic. A flowchart should show the logic used in your code.*

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| Determine how much to move stepper based on change in angular velocity and previous stepper position  Obtain Angular Velocity and Angular Position data from IMU and Gyroscope  Obtain Angular Velocity and Angular Position data from IMU and Gyroscope  Obtain Angular Velocity and Angular Position data from IMU and Gyroscope  Obtain Angular Velocity and Angular Position data from IMU and Gyroscope  If Gyroscope and IMU reads vertical orientation, set stepper to turn all canards flat. |