AE 483 Technical Plan

The Wii remote sends data from its sensors to the Wii console over Bluetooth, utilizing the Human Interface Device standard. This Bluetooth capability means the remote can instead be connected to personal computers. Furthermore, the sensor data the Wii remote provides includes accelerometer data, button press data, and where the remote is pointing. This pointing data is acquired by the remote via an infrared sensor on its front that can be used with infrared sources (such as the official Wii sensor bar, separate infrared LEDs, or even candles) to serve as reference points in the remote's infrared camera view. These reference points then allow calibration of the remote so that its pointing data can be used in spatial context. In the Wii, this calibration allows pointing to specific locations onscreen.

Technical objectives:

- Connect Wii remote to Mac using Bluetooth
- Use DarwiinRemote mapping as HID input
- Record input in Python
- Verify collection of pointing data from Wii remote
- Verify collection of accelerometer data from Wii remote
- Verify collection of button press data from Wii remote
- Log pointing and accelerometer data
- Interpret data into flight path for drone
- Execute flight path on drone

Operational usage:

- Press <some button> to initiate control input
- Move remote according to desired flight path
- Press <some button> to end control input
- Computer processes remote input and flies drone

Operational modes:

- Copycat
  - Drone flies in same path as traced by remote
  - Uses IR sensor to collect positions
  - Human-level operation feels like path planning
- Spellcaster
  - Drone flies in pre-programmed flight path
  - Specific pre-programmed path chosen by user
  - Choice made by specific accelerometer/IR input
  - Human-level operation feels like a magic wand
- Live
  - Drone matches live inputs from remote
  - Moves to pointing position
  - Use Crazyflie Flient with mapping to DarwiinRemote map
  - Human-level operation feels like drawing

Additional considerations:

- Out-of-plane flying could be added by assigning forward and backward buttons (would apply to Spellcaster and Live
- Specify which plane to draw in