# Autonomous Software Architecture

## Design of Software

Most software can be divided into two parts the initialization and the loop.

## Sensors Communication (I2C)

History i2c

I2C was developed by Philips Semiconductor during the early-80s to connect several low speed devices.

Purpose i2c

Benefits of i2c

I2C was developed by Philips Semiconductor during the early-80s to connect several low speed devices over the same lines, this allowed the saving of pins during the connections. Rather than use two pins for each sensor, two pins are used for a single array of sensors. The two pins are label Clock (SCL) and Data (SDA). SDA is used to transfer data between the slave and master devices, note that the SDA is half-duplex thus we can only communicate one direction at a time.

The method of communication between each device is done by giving each device a unique 8-bit address (eg. 0x1E) and requesting data from it. This request is also done by sending the address of the required data. An example of how this is done is detailed in section XX.

I2C SENSOR DIAGRAM HERE

## Sensor Filtration

COPY FROM MIDTERM REPORT

## Telemetry/Communication

Telemetry is the method by which the UAV communicates with the GCS. Specifically the UAV uses a 2.4GHz RF transceiver to send sensor data and to receive commands from the GCS. Just as most of the systems are interrupt driven, so is the communication subsystem. Interrupts are perfect for communication because communication is an irregular event, and irregular events are what interrupts are best for.