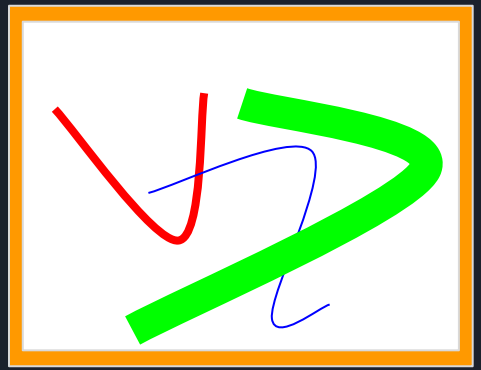
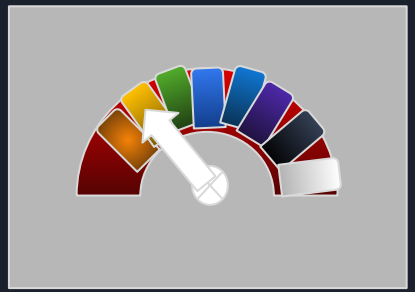
# Motion Tracked Paint Brush

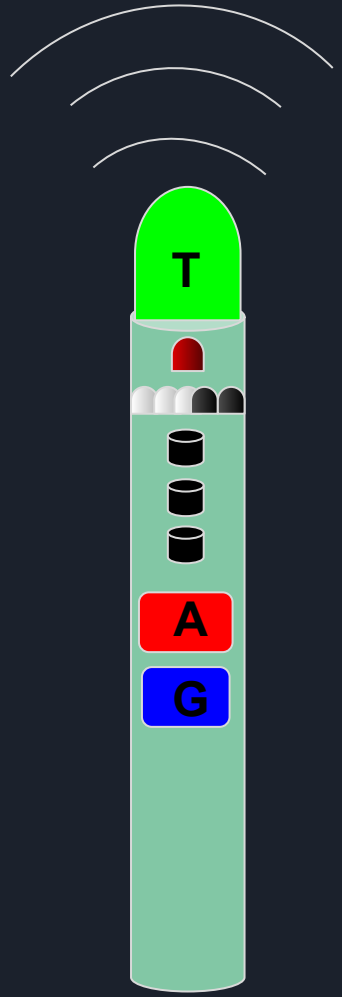
Physical strokes of a hand held brush embedded system are rendered onto a digital screen.

# Features of Brush:

-Physical strokes rendered onto screen.
-Buttons toggle painting, color selection, and brush stroke size selection.
-Color wheel
-LED shows currently selected color.
-Row of LEDs display currently selected brush stroke size







Accelerometer and gyroscope use sensor fusion to accurately obtain angular position.

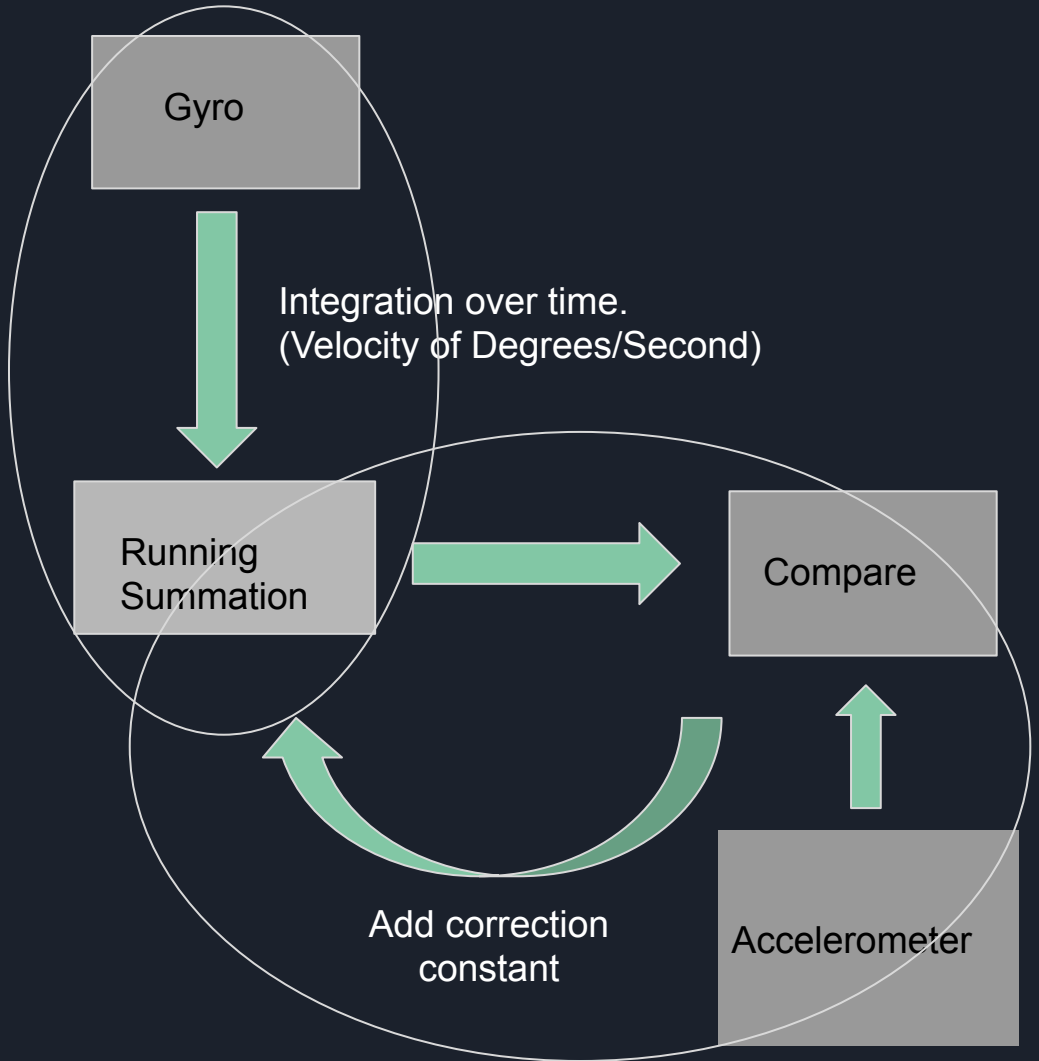
## Sensor Fusion:

Gyro:

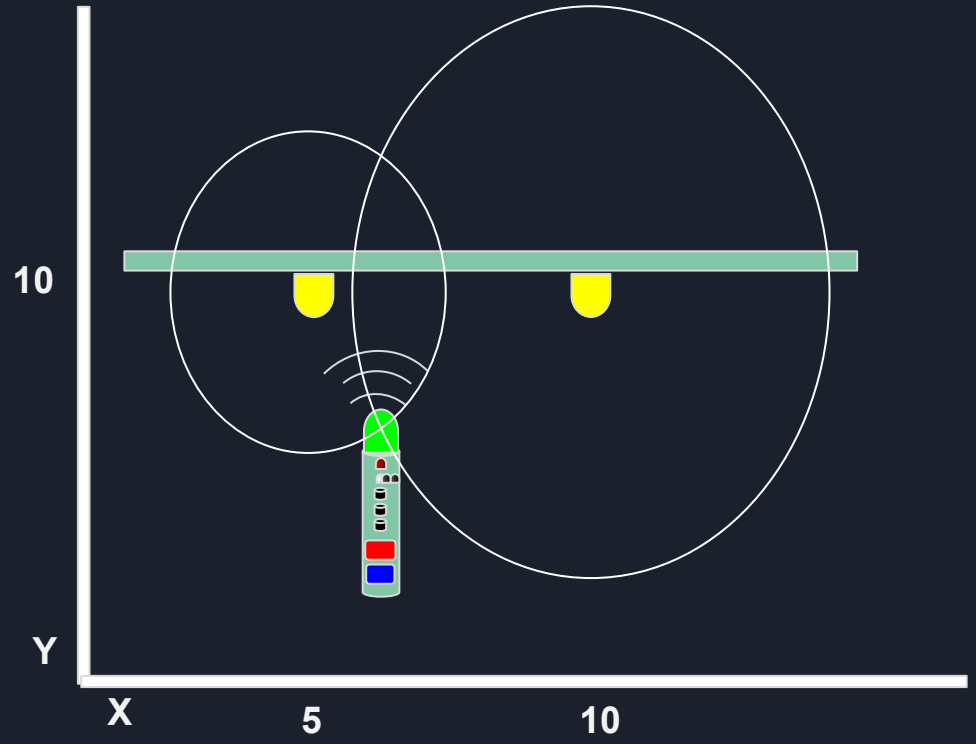
Pros: Smooth transitional readings
Cons:Has drift errors due to imperfections

Accelerometer:

Pros: Has a constant reference to ground.
Cons:Very sensitive device which returns unreliable data as values that spike in random directions.



Two ultrasound receivers and one ultrasound transmitter to obtain local x, y position through triangulation.




**speed of sound in dry air at 20 °C =**

**343 m / s**

(x-5)^2+(y-10)^2=(Dist_to_Sens1)^2

(x-10)^2+(y-10)^2=(Dist_to_Sens2)^2

# Web Server Features

- Real time updates from microprocessor to server with HTTP
  - Will run at 60 FPS to match most display panels
- Server provides update to website session
  - Additional logic can be implemented in the event that calculations prove too complex on FPGA
- Website session paints
  - Drawing motions
  - Color change context
  - Thickness change context