Setpoint = 0;

theta = 0; omega; omega\_old = 0;

error; error\_old = 0; error\_d; error\_i = 0;

t\_step = 0.1;

K\_p = 1; K\_d = 1; K\_i = 1; Percent;

Max = 1; Min = 0.1;

Loop {

omega = read from IMU;

theta = theta + average(omega, omega\_old)\*t\_step;

error = Setpoint – theta;

error\_d = (error – error\_old)/t\_step;

error\_i = error + average(error,error\_old)\*t\_step;

Ctrl = K\_p\*error + K\_d\*error\_d + K\_i\*error\_i;

If (Ctrl > 1) { Ctrl = Max }

If (Ctrl < -1) { Ctrl = - Max }

If (absolute value(Ctrl) < Min) { Ctrl = 0 }

If (Ctrl > 0) { Generate PWM at <Ctrl>% Duty cycle

Send to positive direction thruster }

If (Ctrl < 0) {Generate PWM at <Ctrl>% Duty cycle

Send to negative direction thrusters

}

error\_old = error;

omega\_old = omega;

}