

Recieve data from TIVA



Run Madgwick AHRS

Extract acceleration

Check for new ultrasonic data



Run selective noise filter

Rotate acceleration to Earth frame



Subtract gravity vector



Predict state-space from acceleration

Distance meas. valid?

Y



Update state-space from distance



Run for each 1kHz sample



Downsample state-space estimate



Calculate output



Send motor speed command

Run at 200Hz on RT Linux