Optimal Final Project Proposal

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We are proposing to develop an AHRS particle filter for use in a magnetically challenged environment and comparing it to an Extended Kalman Filter in the same environment. A 9 DoF IMU will be used, providing 3 axis gyroscope, accelerometer, and magnetometer measurements. The IMU will be mounted in a static position, and ferrous material (a magnet) will be introduced to the environment after recording static, magnetically clean datasets for both filters. The heading estimate will be compared from the particle filter to the EKF on the same dataset, and the particle filter will have better resiliency to this unmodelled magnetic disturbance.