

Abstract

This project is focused on making the use of inertial navigation to map out the movements of a Robot. Using inexpensive accelerometers, gyroscopes, and magnetometers for inertial navigation is problematic as these sensors have massive inaccuracies mainly due to drift and calibration errors. Our solution is a combination of methods dealing in three main categories: mechanical improvements, electrical improvements, and software improvements to the data collected from the sensors. We use the concepts of viscous damping to reduce noise, we also use various data processing techniques such as moving average filters. These solutions work in unison to reduce the error and make the results more comparable to those in real life. The difference between the raw data and data with the corrections is 500 – 1500% more accurate depending on the tests.