

Abstract

Notable problems in Simultaneous Localization and Mapping (SLAM) are caused by biases and drifts in both exteroceptive and proprioceptive sensors. The impacts of sensor biases include inconsistent map estimates and inaccurate localization. Unlike Map Aided Localisation with Joint Sensor Bias Estimation (MAL-JSBE), SLAM with Joint Sensor Bias Estimation (SLAM-JSBE) is more complex as it encompasses a state space, which increases with the discovery of new landmarks and the inherent map to vehicle correlations. The properties such as observability, error bounds and convergence rates of SLAM-JSBE using an augmented estimation theoretic, state space approach, are investigated here. SLAM-JSBE experiments, which adhere to the derived constraints, are demonstrated using a low cost inertial navigation sensor suite.