

Investigating State Covariance Properties during Finite Escape Time in H^∞ Filter SLAM

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Abstract.

This paper deals with the investigation of finite escape time problem in H^∞ Filter based localization and mapping. Finite escape time in H^∞ Filter has restricted the technique to be applied as the mobile robot cannot determine its location effectively due to inconsistent information. Therefore, an analysis to improved the current H^∞ Filter Three main factors are being considered in this research namely the initial state covariance, the γ values and the type of noises. This paper also proposed a modified H^∞ Filter to reduce the finite escape time problem in the estimation. The analysis and simulation results determine that the modified H^∞ Filter has better performance compared to the normal H^∞ Filter as well as to Kalman Filter for different γ , initial state covariance and works well in non-gaussian noise environment.

Keywords: H^∞ Filter, Finite Escape Time, Estimation.