DATA ASSOCIATION ANALYSIS IN SIMULTANEOUS LOCALIZATION AND MAPPING PROBLEM

Hamzah Ahmada, Nur Aqilah Othmana, Mohd Mawardi Saaria, Mohd Syakirin Ramlia, Bakiss Hiyana Abu Bakarb

a Faculty of Electrical & Electronics Engineering, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia
b Politeknik Sultan Ahmad Shah, Semambu, 25350 Kuantan, Pahang, Malaysia

Abstract.

This paper examines the data association issues in Simultaneous Localization and Mapping Problem on two different techniques. Data association determines the system efficiency and there are limited numbers of papers attempts to analyze the conditions. Two filters namely the Extended Kalman Filter(EKF) and H∞ Filters are considered in this paper to improved the estimation results of both mobile robot and the environment locations. The updated state covariance is modified to obtain better performance compared to its original state. The simulation results have shown consistency and lower percentage of errors for the proposed technique. However, there are certain cases that showing the updated state covariance becomes unstable and yields erroneous results especially for EKF. Hence, further works are expected to be carried for this matter.

Keywords: EKF, H∞ Filters, Simultaneous Localization and Mapping, State Covariance, Data association.