

Data association or the correspondence problem is often considered as one of the key challenges in every state estimation algorithm in robotics. This paper introduces an efficient multi-dimensional assignment based data association algorithm for simultaneous localization and map building (SLAM) problem in mobile robot navigation. Data association in SLAM problem is compared with the data association in a multi-sensor multi-target tracking context and formulated as a 0-1 integer programming(IP) problem. A suboptimal dual frame assignment based data association scheme is thus formulated using a linear programming relaxation of the IP problem. Simulations were conducted to verify the superior nature of the new data association scheme over the conventional nearest neighbor data association algorithm in the presence of high clutter densities. Experimental results are also presented to verify the enhanced performance of the algorithm.