

# SLAM in Navigation – Towards Dynamic Environment Application

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Simultaneous Localization and Mapping (SLAM) has always been the essential issue in mobile robotics and autonomous vehicle, due to its widely and demanding applications. It is a map building process of an environment, where the map will be use by the vehicle to determine its location. The challenge relies in SLAM is due to the localization and mapping problems that need to be solved together. In general, it is an estimation process without a priori knowledge of the location. SLAM is used in navigation of indoor spaces (museum, offices) as well as in outdoor applications (underwater, exploration, hazardous compounds). Although SLAM has been extensively studied, previous researches are more towards application for static condition. Thus, SLAM in dynamic environment has always been critical and significant, as dynamic scenarios not only exist outdoor, but indoor as well. Dynamic representation in a map often being considered as noise, due to its effect towards performing SLAM. Daily life example of dynamic environment in indoor situation is the open and close door. To distinguish a closed door which has been previously map as open is a challenge for a robot. When this happens, the robot will draw two hypotheses – whether the door status has changed or it is not where it believes to be. As the environment changes over time, the ability of the robot to map dynamic environment is important for long period of applications, for example a personal service robot. Although researches are working towards solving this issue, current approaches have several disadvantages in solving them. It is hope that we can develop solution to encounter the problem.