# Autonomous Kuka Youbot Navigation Based on Machine Learning and Path Planning

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**Abstract :** The following work presents a proposal of autonomous navigation of mobile robots implemented in an omnidirectional robot Kuka Youbot. We have been able to perform the integration of robotic operative system (ROS) and machine learning algorithms. ROS mainly provides two distributions; ROS hydro and ROS Kinect. ROS hydro allows managing the nodes of odometry, kinematics, and path planning with statistical and probabilistic, global and local algorithms based on Adaptive Monte Carlo Localization (AMCL) and Dijkstra. Meanwhile, ROS Kinect is responsible for the detection block of dynamic objects which can be in the points of the planned trajectory obstructing the path of Kuka Youbot. The detection is managed by artificial vision module under a trained neural network based on the single shot multibox detector system (SSD), where the main dynamic objects for detection are human beings and domestic animals among other objects. When the objects are detected, the system modifies the trajectory or wait for the decision of the dynamic obstacle. Finally, the obstacles are skipped from the planned trajectory, and the Kuka Youbot can reach its goal thanks to the machine learning algorithms.

**Keywords :** autonomous navigation, machine learning, path planning, robotic operative system, open source computer vision library

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