**ROS SLAM**

SLAM stands for Simultaneous Localization and Mapping. Its objective is to construct and update a map of an unknown environment using various sensors attached to a robot. The gmapping package provides laser-based SLAM (Simultaneous Localization and Mapping), as a ROS node called slam\_gmapping. The Gmapping algorithm uses data from laser sensors to create a 2D occupancy grid map. The laser sensors used are such as a Lidar and whereas in the mars rover the stereo camera used is called ZED 2i. Initially SLAM starts by estimating the POSE (Position and Orientation) of the robot. And hence this further helps in completing navigation tasks such as path planning, obstacle avoidance and goal following. Some examples of SLAM algorithms are:

1. EKF SLAM => Here EKF stands for Extended Kalman Filter
2. GraphSLAM

