Simultaneous Localization and Mapping (SLAM) is an open research area in the field of robotics. SLAM is how many robots navigate an unknown environment, but there are several approaches used today. This project has found three algorithms in common use and compared them using a simulation. Robot Operating System (ROS) was used for both the SLAM algorithms and the simulation software. Additionally, the algorithms are hoped to be deployed and tested on hardware using a custom built Turtlebot. This research was funded in part by the Dr. Snowden Memorial Scholarship with the NASA Oklahoma Space Grant Consortium. This material is based upon work supported by NASA issued through the OSGC.