Table of contents

1. Introduction

   - motivation (?)
     - General information about the value of testing robots in a simulated
     - environment, rapid testing in realistic scenarios
   - Previous work (Focusing on specific papers on this robot)
     - Goals (To make an accurate simulation and possibly compare results with the real robot)

2. Clothoids

   - Use of clothoids
   - implementation

3. Robot Model, ROS and Gazebo setup

   - Fusion 360, inertias, collision and visual models
   - Gazebo libraries, packages, launch files
   - ROS conventions, tf, naming.
   - ROS1 setup (in the two last sections i could explain, with flow diagrams, how some of the packages work as it may be important for one to understand what happens in the background eg. ros_control https://classic.gazebosim.org/tutorials?tut=ros_control&ver=1.9+)

   packages i used: ros_control robot_localization ar_track_alvar

4. Controllers

   - Explanations for each one i implement

5. Results - Future work

   - Use case, working example
   - Experiments (?)
   - No access to the real robot so we can tune the simulation.