

Robot Art Gallery Project Report

In the course

ARAMS - Advanced Robotics and
Autonomous Mobile Systems

Done by:

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Methodology

- Begin from the initial coordinates
- Mapping of the whole environment
- Navigation of the Turtlebot to different coordinates and making a list for the bot to follow
- Face the walls at every coordinates in given orientation to take pictures of the walls
- Create bounding boxes around the images detected
- If multiple images are detected on the same wall, then crop the right edge of the bounding box of the left most image and repeat the process
- Scan all the images taken in the end and perform image detection
- Detection of April Tag associated with the art with YOLO and OpenCV
- Finally display all the images detected along with the name of the image and the associated april tag number

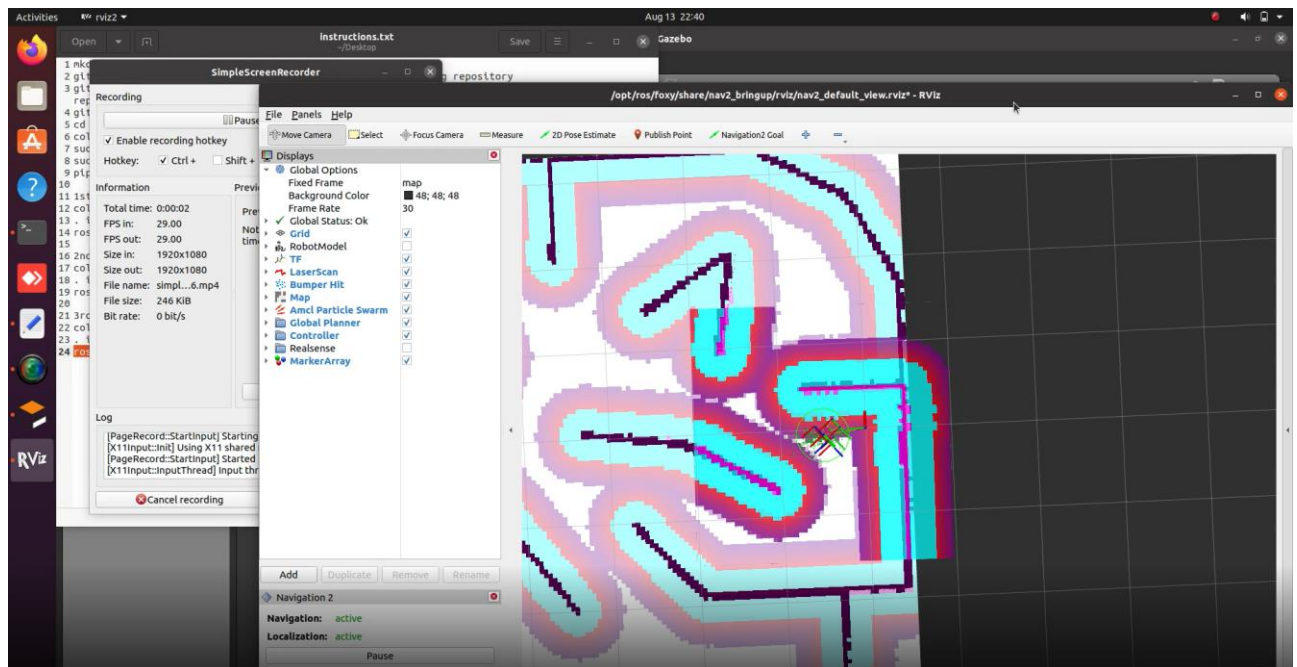
Resources

- OpenCV
- Python tutorials
- ROS2 tutorials
- YOLO
- ARAMS 2022 course on ILIAS

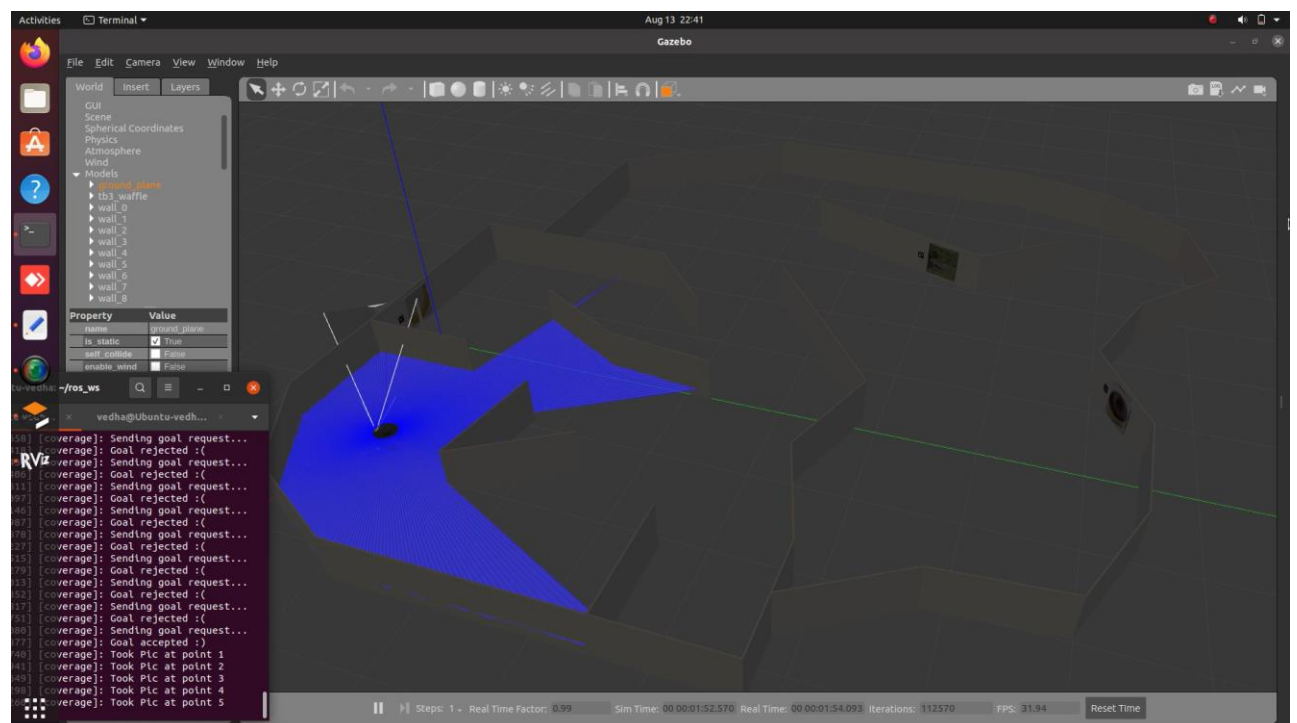
Future Improvements

- Improved process flow
- Directly detecting the AR tags was causing the laptop to be hung, hence pictures of all the walls were taken and then image detection was done. Working on a more powerful laptop would help
- If directly AR tags were detected, then the code length would be reduced as well.
- Sometime the robot crashes to the wall and it has to be restarted. The cause for this is maybe the wall isn't visible from a particular angle for the bot.

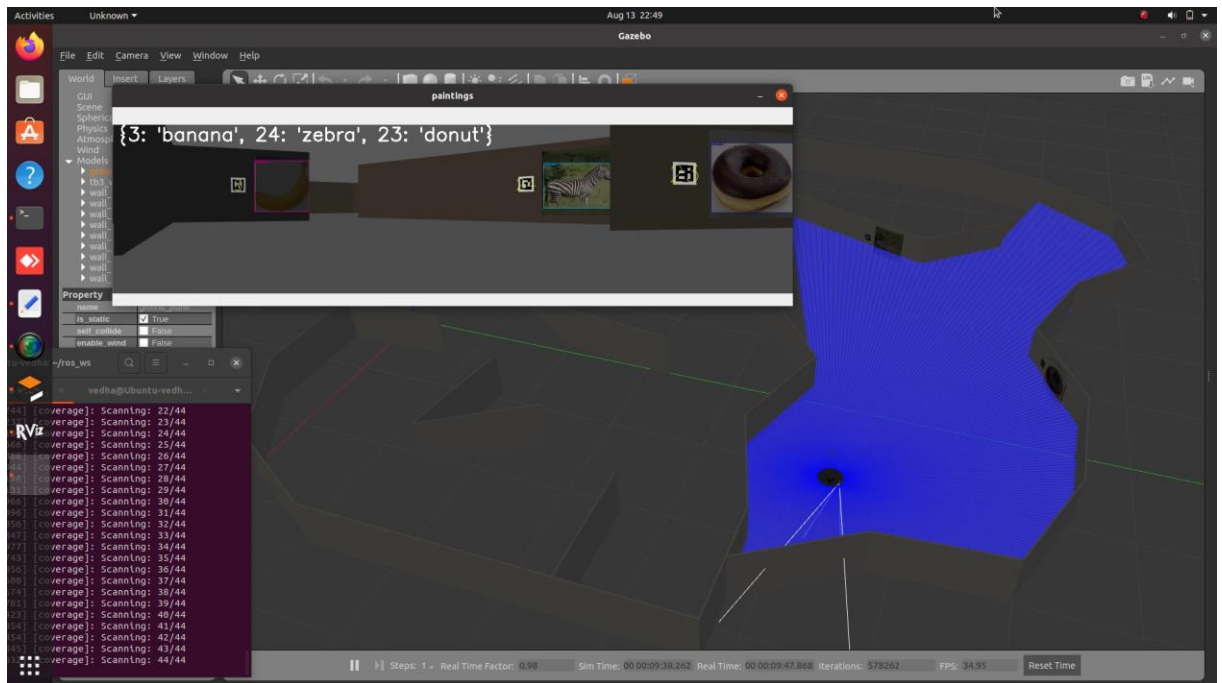
Screenshots for reference



Initialisation



Navigation with image detection



Output at the end