Lab Report

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2) If there are a lot of noisy LIDAR sensor readings but perfect odometry the robot will assume there are obstacles where there are none, and if the pose_theta odometry is noisy but the LIDAR is accurate then the bearing error will be negatively affected due to the LIDAR readings returning to an incorrect pose_theta. A noisy pose_theta means that when the LIDARS sensors return to the robot they return to an incorrect position (as pose_theta is off) subsequently causing the bearing error to be incorrect as well.

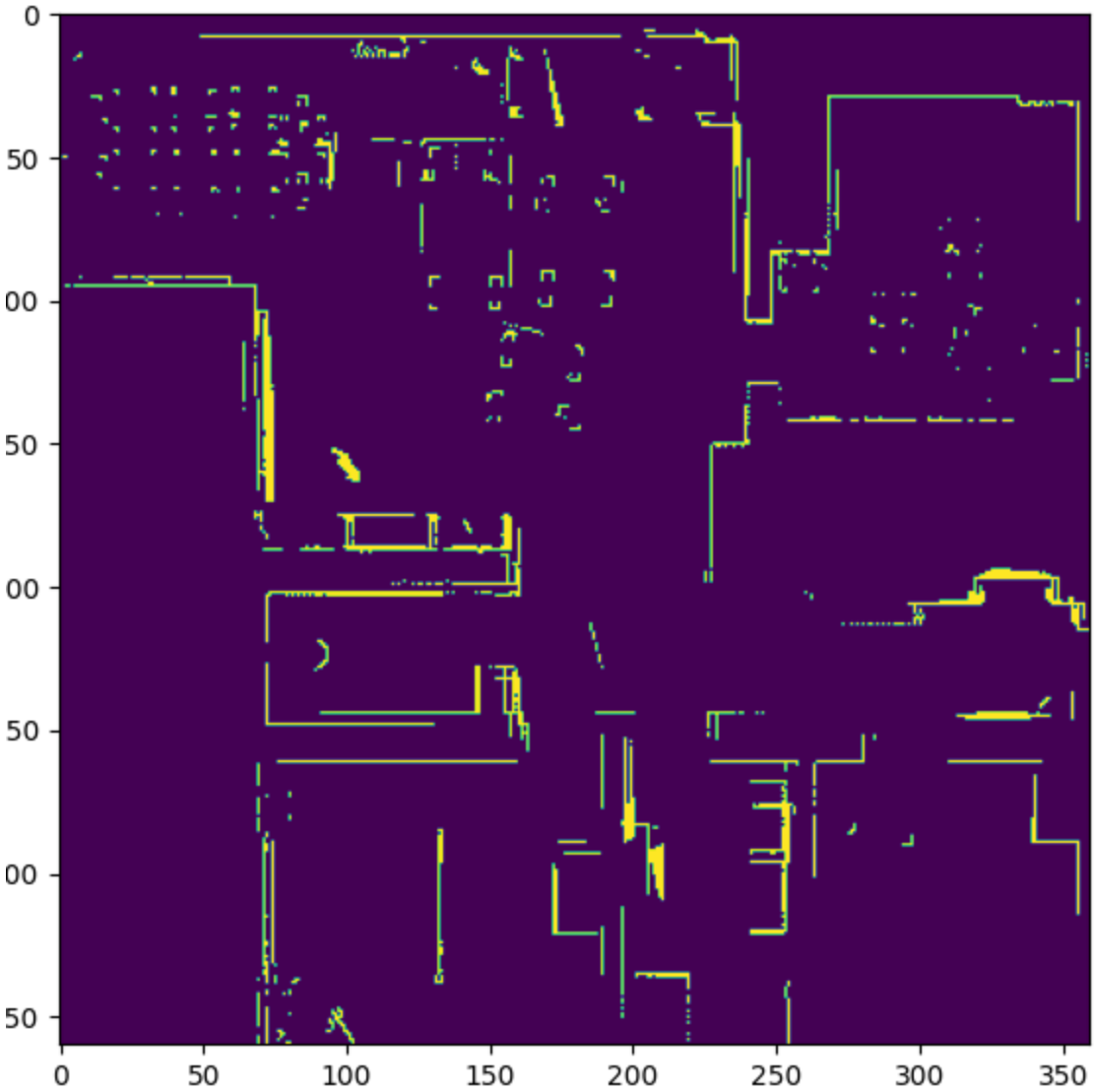
3) Assuming incrementing the map entry means configuring the buffers, if the value is too small the robot runs the risk of bumping into things in turns / corrections when iterating over its computed path, and if it is too big the robot will be very constricted in computing its path and possibly be forced to take roundabout ways if a corridor is too narrow on the buffered map.

4) We chose the threshold value through trial and error. If it is too small, too much noise is allowed to pass through. If it is too large, the obstacles are not defined enough to be computed correctly. It also cuts off the corners of obstacles / anything that was not proven enough times.

5) You could possibly take in sensor readings while traversing the path, and if it detects a discrepancy with the map it already knows, it pauses, regenerates the map, and calculates a new path accordingly.

6) It probably wouldn't return the shortest possible path due to the existing form of the graph biasing future iterations leading to non-optimal solutions, but it would return a path in general. It would look significantly more block-y.

7) Way too much time. Easily over 25 hours. And we weren't even able to get the IK controller working properly to our dismay even after visiting office hours. We put a ton of effort into it though and we are proud of the progress we made and the cool things we learned from it regardless.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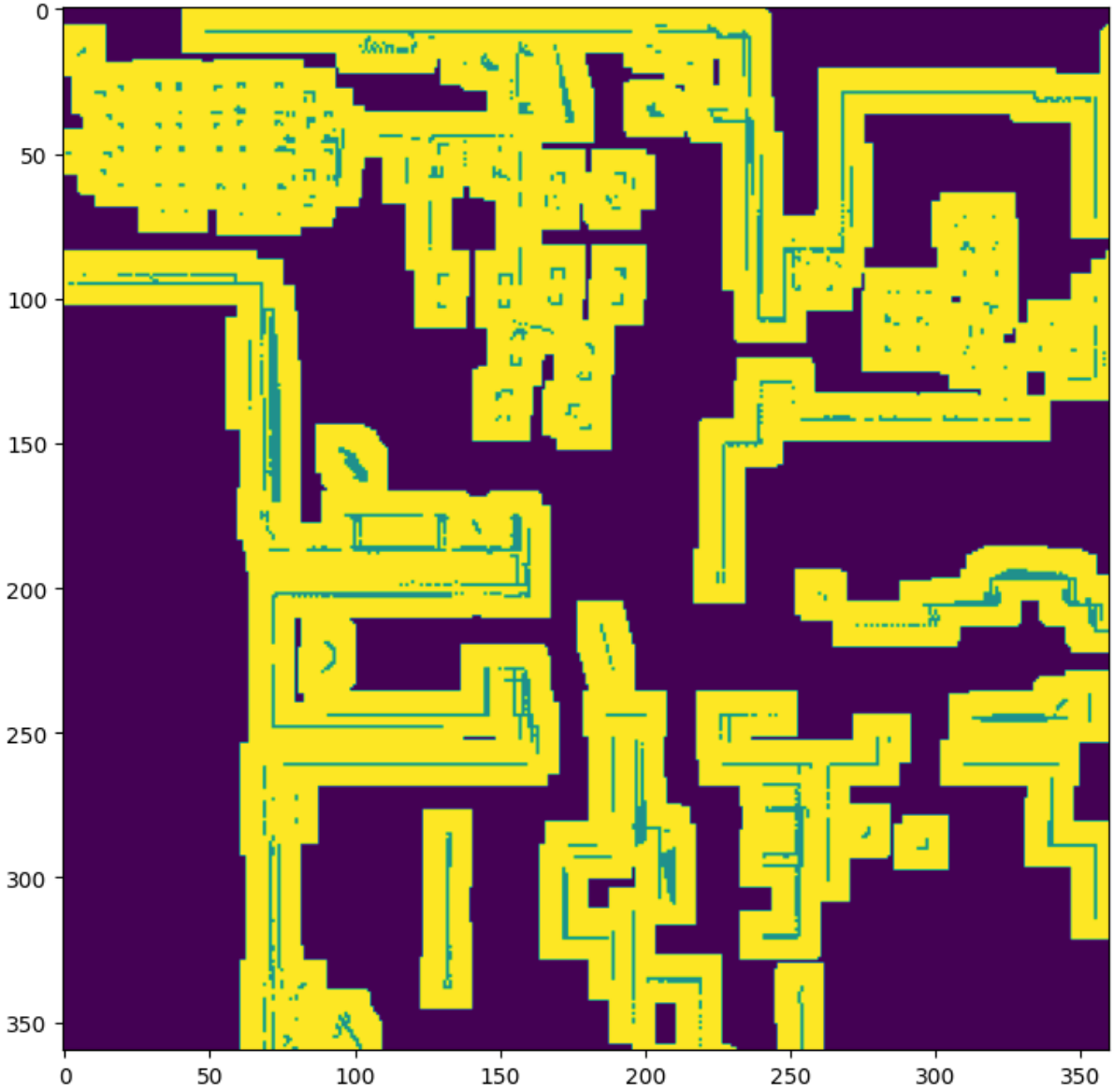
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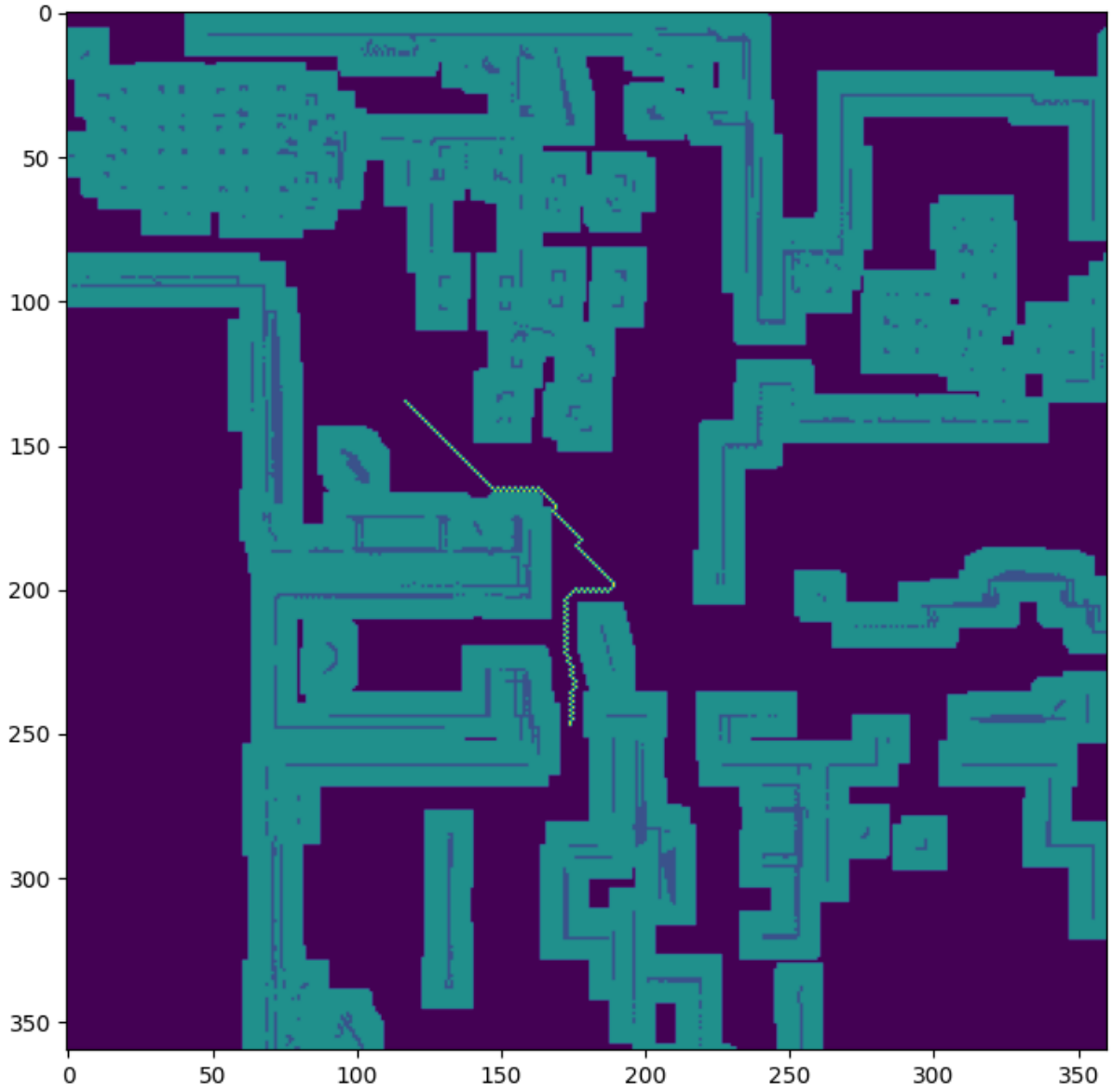
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