REAL-TIME IMAGE PROCESSING FOR AUTONOMOUS GUIDANCE OF MAZE FOLLOWING ROBOT

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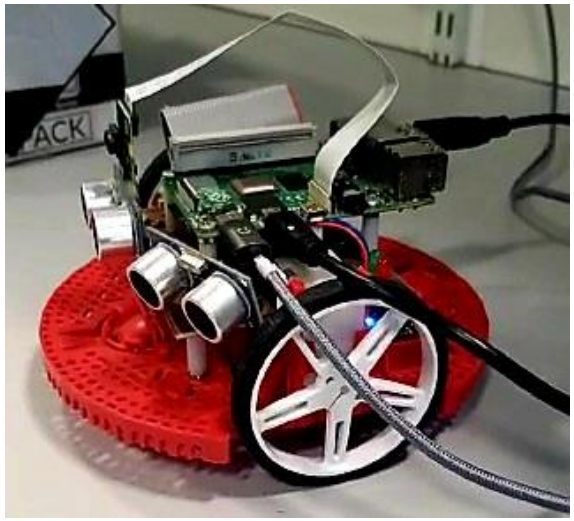
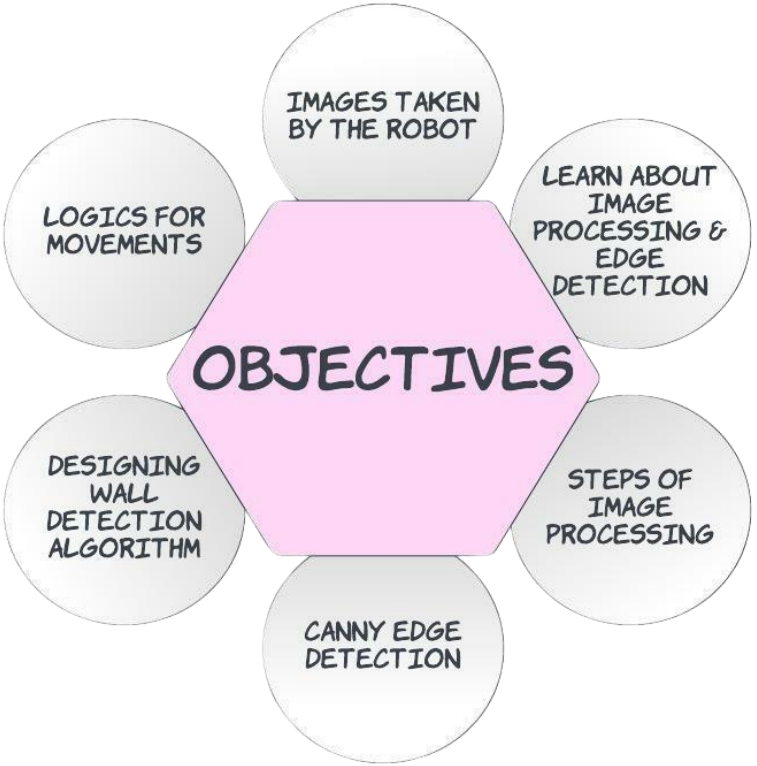
INTRODUCTION

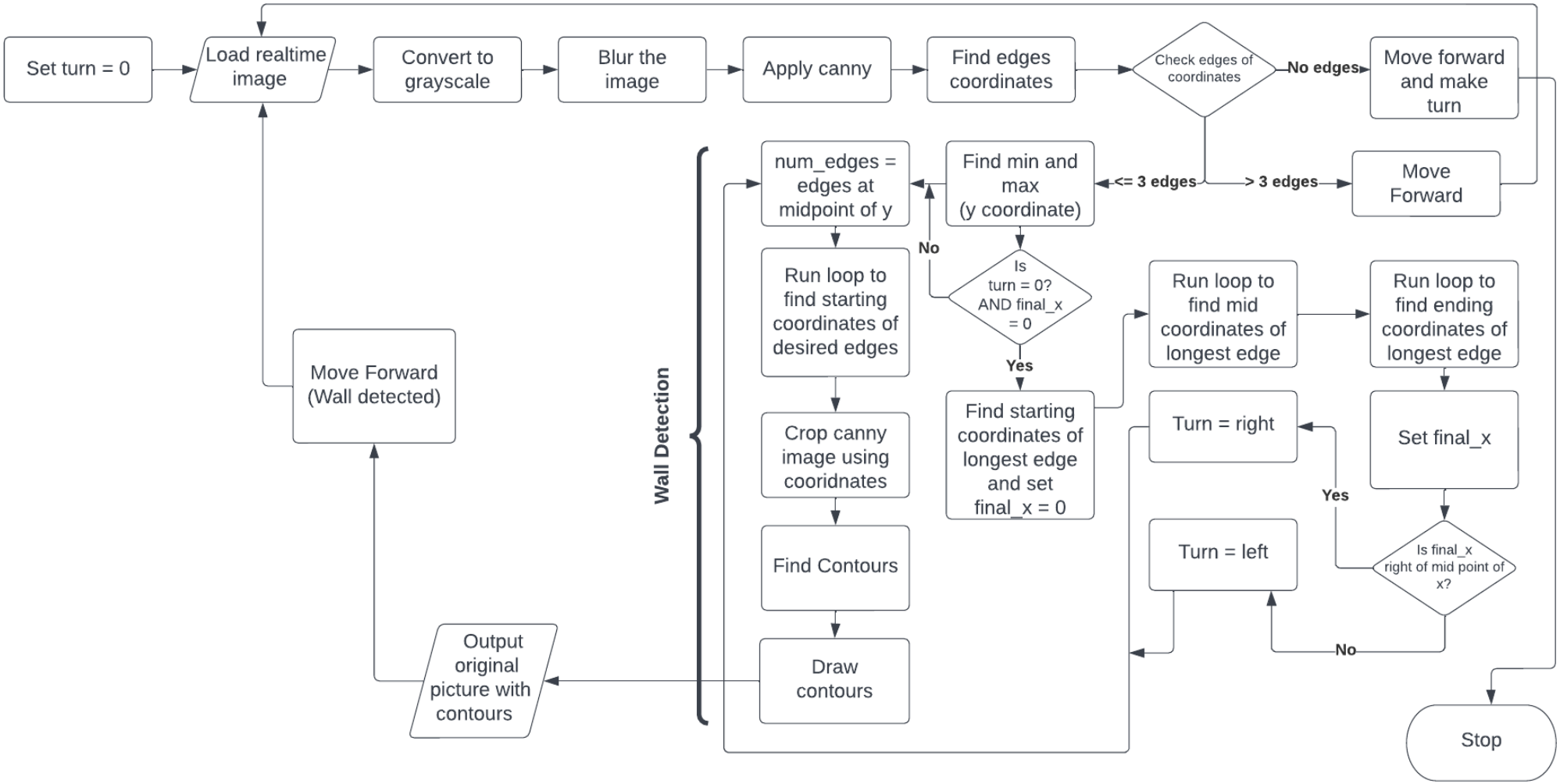
1. THE PROJECT AIMS TO DESIGN AN AUTONOMOUS ROBOT THAT MOVES INSIDE THE MAZE
2. THE ROBOT IS BEING GUIDED BY DETECTING WALLS USING REAL-TIME IMAGE PROCESSING
3. THE ROBOT PERFORMS FEATURE DETECTION WITH THE HELP OF THE ALGORITHM AND TAKES RIGHT/LEFT TURN ACCORDINGLY



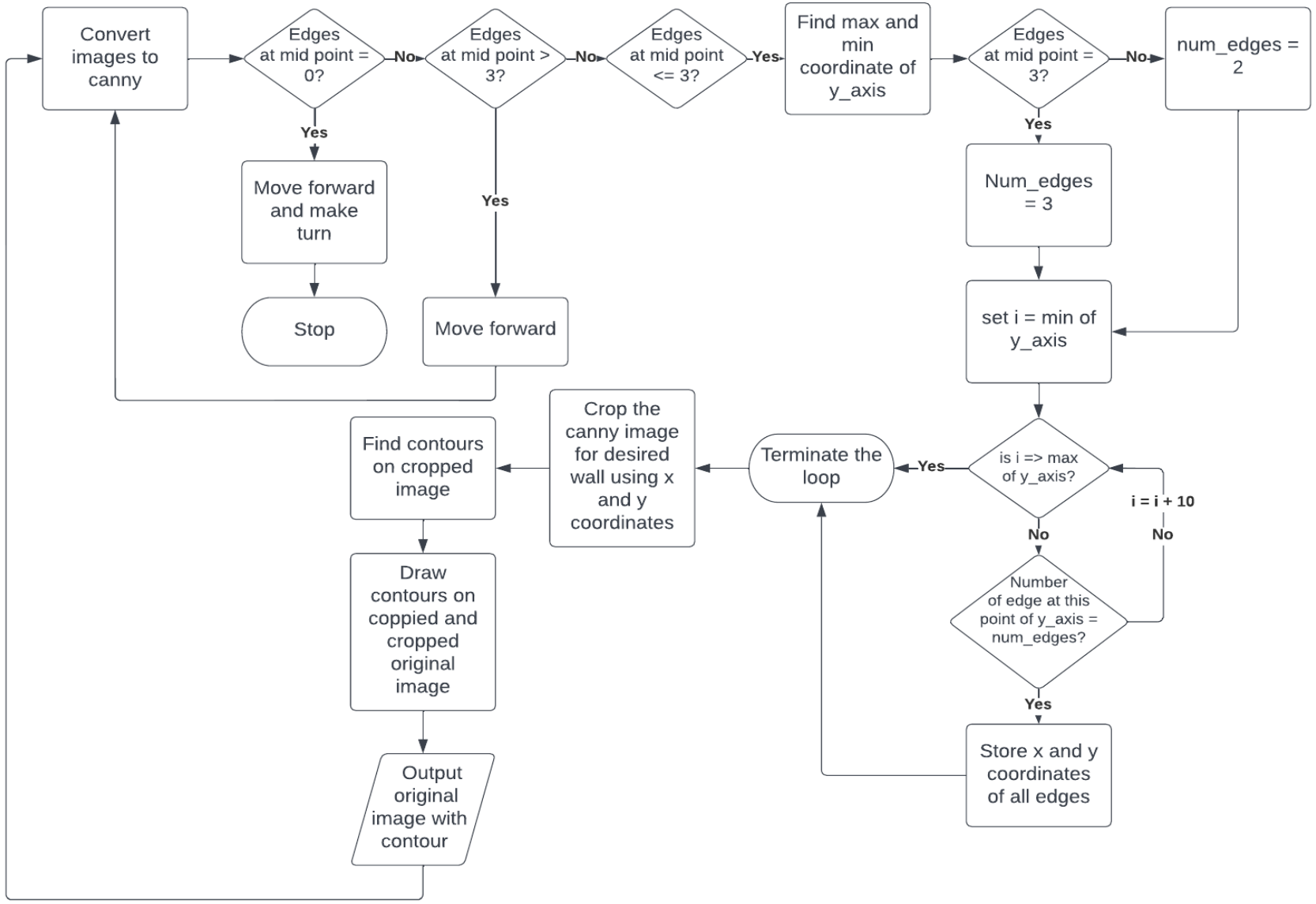
Autonomous Robot



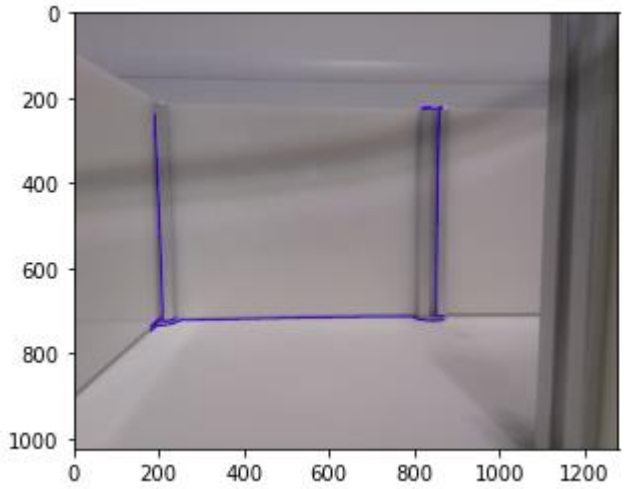
METHODOLOGY



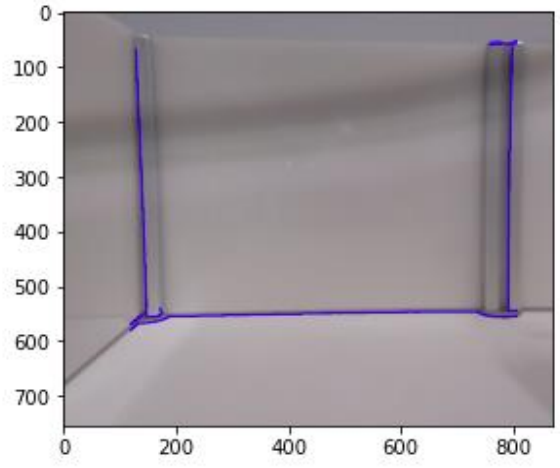
WALL DETECTION ALGORITHM



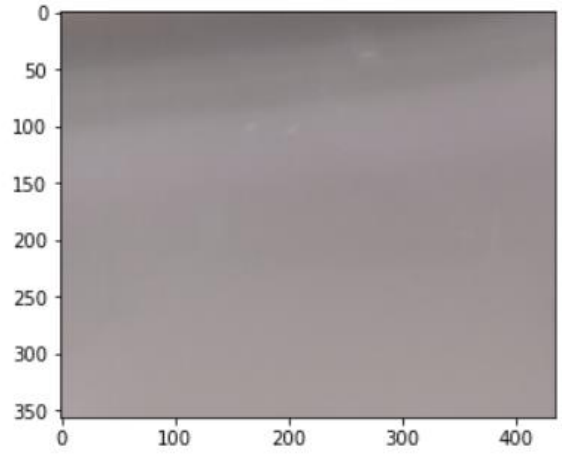
LOGIC FOR MOVEMENTS



When Robot is at entrance



When Robot has moved forward



When Robot is close to turn

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Now performing wall detection on image  6.jpg because wall is near now and moving forward for 5 secs
Looking for turn....
195 This is the value
We have found a break in a line or this is not the line you are looking for searching again...
We have found a break in a line or this is not the line you are looking for searching again...
your turning is on the left since the lenght of edge on left side is:  951.6438409405065
Now performing wall detection on image  5.jpg because wall is near now and moving forward for 5 secs
Now performing wall detection on image  4.jpg because wall is near now and moving forward for 5 secs
Now performing wall detection on image  3.jpg because wall is near now and moving forward for 5 secs
Now performing wall detection on image  2.jpg because wall is near now and moving forward for 5 secs
Moving forward for 5 secs then making Left turn
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Output of Logic

CONCLUSION & FUTURE WORK

- The project achieves the goal of guiding the robot autonomously in the maze by doing image processing
- Real-time images are taken from the robot's camera at the start of the coding
- The algorithm identifies the walls ahead of the robot using canny edge detection on the images
- Logic for movements are designed for the robot to move forward, left and right
- Satisfied results are achieved using the images taken from the robot
- Robot's movement is tested using a simple Python code
- The final code is not yet implemented on the robot so it can done to examine the integration of the code with the robot