Implementation of Robot Behaviour Learning Simulator

Kushagra Singh Bisen

Ecole des Mines de Saint Etienne

kushagrasingh.bisen@etu.emse.fr

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Overview

1. Simulation
   - Recap
   - Today's Agenda
     - Alternative to SLAM
   - Orientation of the Robot
2. Log File

Recap from Last Week.

In our last meeting, we

- Saw a simulation and motion planning using SLAM.
- Discussed about if SLAM is the way to go or not.
- Discussion about the log file.

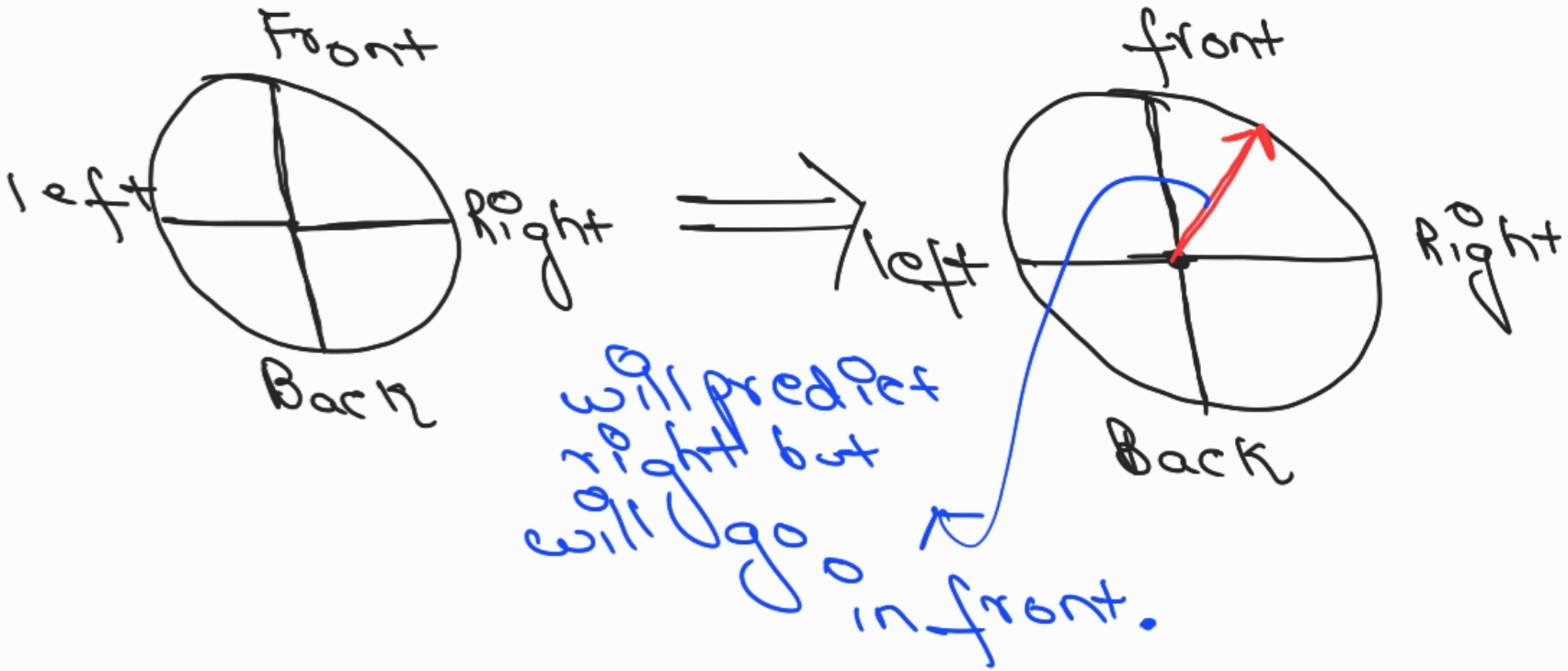
A Method apart from SLAM

- In the last meeting, we felt that SLAM might not be the way to move forward with the simulator.
- We might need to see other ways to achieve the goals, if required.
- I also demonstrated a simple 'Go-Right' simulator logic.

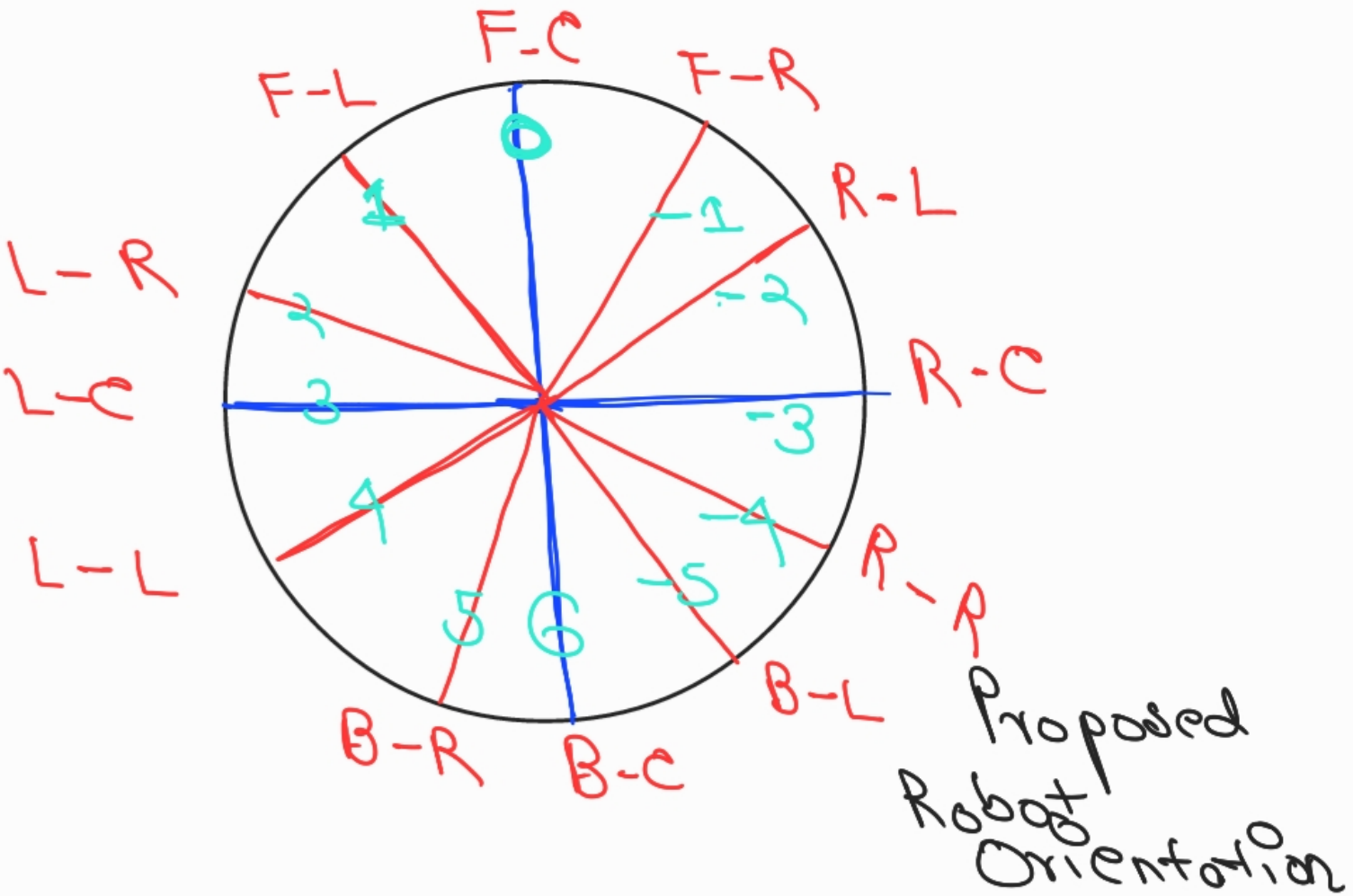
A Method Apart from SLAM

- In the small reinforcement learning of the simulator log file, I remember that in one such case, the Model predicted RIGHT, when actual value was FRONT.
- Robot has a 360°field of motion. I think that maybe, if we can record the movements in more than 4 such ways, we may have a better accuracy in prediction?
- I am not sure how this will affect the Machine Learning Model, and if you need me to reverse back to 4 stages. I can do that.

Robot's Orientation



Proposed Robot's Orientation



Algorithm Employed

For the motion planning and obstacle avoidance of the turtlebot,

- We use the LIDAR (Light Detection and Ranging) sensor for this.
- Goal is to keep being straight, i.e Front-Center
- We check if there is an obstacle, if yes, we check if it is the cheapest. Otherwise, we keep moving.
- As the goal is to be Front-Center, we change the angular velocity of the robot in the same manner (using the cost values)

Simulation

Let us see the simulation now.

Log File

I haven't prepared the log file, but I can log the data of x,y and presence of obstacle, and the next turn i.e Front-Center and Right-Center in the terminal. I will try to log them and format in a file and send it to you later, if it is fine by you.

Thank you for your time!