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Project Name: Duck Dance

## Abstract

For this project we are creating a world where we have multiple robots following a lead robot similar to how ducks follow one another. In this world we will create a variety of obstacles that the lead robot will map out and create a path through from a starting point to a goal point. At the beginning of the simulation the following robots will leave the lead robot and find places along the map; these will be hard coded goal locations. Then the lead robot will start making its way around the pond and map. Along the path the lead robot creates it will pass by the following robots and when the following robots are passed they will start to follow the line that the lead created. At the end of the simulation the lead robot will have multiple following robots.

## Equipment

1. Webots
2. Epucks
3. Turtle robot

## Deliverables and Implementation Plan

- ❖ Create our world in webots -- deadline---Nov 11 -- Lead--Ali
  - Creating obstacles
    - Rocks
    - Pond
    - Benches
    - Tree
  - Creating robots
    - Basic controller setup
      - Different sizes of the robots
      - Basic line following code for the following robots
    - LIDAR sensing setup for lead robot
- ❖ Implement code for lead robot--deadline--aim for Nov 19-- hard cut off--Nov 24 -- Lead -- Nova
  - Mapping of the world using LIDAR
    - Mini pop out map that shows what the lead robot sees
      - Different colors for obstacles and free space. Show path that is being drawn
    - Alter the world and place down a line that the following robot will use
      - Path must be obstacle free

- Upon getting to the goal point the line will draw out a rubber Duck
- ❖ Implementing the following robots -- deadline-- Dec 4 -- Lead-- Lauren
  - Code goal points that the robots will go to
  - Detect lead robot
    - Have a wait time to begin following lead
    - Stop when the big robot stops
  - Distinguishing the line from the world
  - Following the line
    - Not hitting robots in front of them
- ❖ Debugging/ adding extras --deadline--Dec 8
  - Make sure project is complete
  - Add extras that we see fit

## **Demo**

We will present our project showing that our code successfully allows the implementation of the robots to follow the line that the lead robot makes. This will prove that our design works.