## **Traffic Cozmo**

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### **Problem Statement**

How do we make Cozmo follow any race track pattern and recognize when to start, stop, slow down, based on external signals such as traffic lights?

# Approach: Line Following

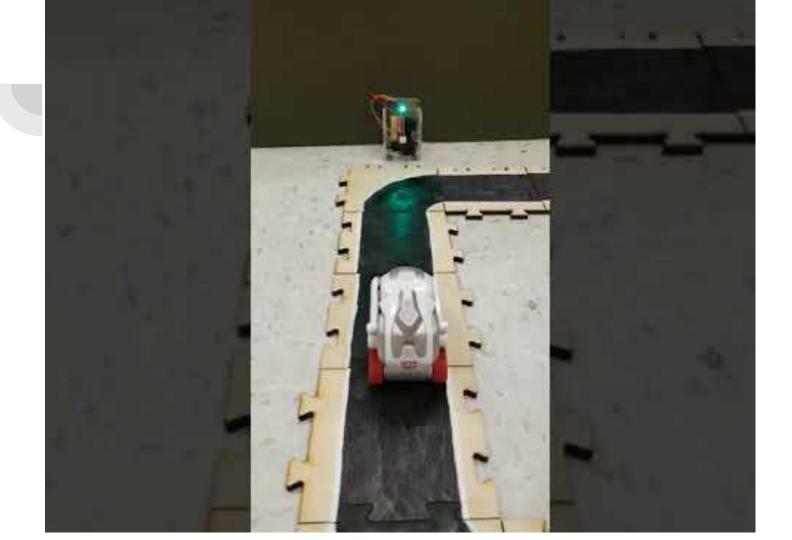
## Approach: Line Following

- 4 sets of training data
  - 800+ images total
- 4 output nodes from 3 layer neural network
  - Forward, left, right, lost
- Recovery from lost position
  - Back up until familiar image comes to sight
- CrossEntropyLoss() function

#### **Approach: Light Detection**

- openCV: filter for red clusters of pixels
  - Based on threshold value
- Look at top 50% of image
  - Cozmo at set head angle

## **Demo Videos**





# Results

#### **Results & Observations**

- Line following works 70% of the time
  - Gets distracted by other objects
  - Trained on many different tracks, adjust model to avoid "jack of all trades, master of none" situation
- Light Detection
  - Lagging behind due to wireless
  - Need more image filtering
- Can use ML training for Light detection as well

#### **Future Work**

- Custom tracks with different bend radius
- More than one cozmo on the course at a time
- Faster image processing
- Decision making based on previous actions