Introduction

General motivation

- Robots close to humans, autonomous car research done by companies, application areas, explain why autonomous systems will be useful in these areas.

Introduce Solution

- Start describing what a solution looks like, introduce the main tools (i.e. RL) state your approach with a bit of justification with tools.
- Explain inclusion of personal space?

below not included currently

Personal space

- Talk about the idea of social norms and personal space, Explain how people are able to navigate (for the most part) without cutting people off or abruptly stoping. Explain the benefit of giving robots this ablity (use Toronto banning sidewalk robots)

Problem Formulation

- *Currently includes personal space info (see intro)*
- Explicit explaination of the problem
- Explicit definition of metrics and comparrisons to be used
- *This section will likely be cut*

Background

Reinforcement Learning

- Basics
- Model-Based vs. Model-Free Reinforcement Learning

Deep Learning

- Artificial Neural Networks
- Convolutional Neural Networks
- Recurrent Networks and LSTM

Current Navigation Methods

- Map vs Map-less
- Vision-based Navigation
- Deep Reinforcement Learning

Analysis and Design

Currently labeled as such, thinking about removing Analysis (is part of current nav methods?)

Action Space definition

- Define action and state space

> This is where I have things written until (~12 pages)

- Introduce and describe the action planner
- Describe the RL/DL problem
  - Explain stimuli
  - Explain pedestrain personal space model
  - Explain model architecture
- Webots controller/ Data collection
- Carla controller/ Data collection

Implementation

Webots

- scenario
- data

- results

Carla

- scenario
- data
- results
- compare with ORCA/ carla AI Pedestrian controller

Real life/robot

- video qualitative results

Conclusion

- I hopefully succeded and point to some possible future work