Project Proposal
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Team Members
- Siena Okuno
- Mary Keenan
- Cedric Kim

Project Summary
Our desired Neato behavior for this project will be a group of robots that can identify and follow each other using machine learning. They'll use their cameras and possibly lidar sensors to do so. The Neatos will have respect for each others' personal space and avoid bumping each other. The leader will avoid obstacles.

Similar Research
Deep learning algorithm to track people in a camera:
https://towardsdatascience.com/drone-follow-me-ed0d15e62498
This could be useful for the way we create our algorithm

MVP and Beyond
Our MVP is at least 1 Neato to follow a "leader" Neato. As a stretch goal, these Neatos will follow each other in a particular order to prevent them from bumping into each other and track one specific person for the leader to follow.

Learning Orientation
We're all interested in top-down learning. We'd rather create a more polished final project (and not reinvent the wheel) as well as develop skills that will be more useful to us in a professional setting.

Data Collection Plan
We will have two robots - one robot will be teleoperated, and the other robot will be our data collection robot. We will follow the other neato (with teleop) as best as we can, and take pictures of the neato. These pictures will have to include some background neatos to keep the neato following the closest target. For our stretch goal, the same technique will be applied but with following a person.

Learning Algorithms
We don't have any personal preferences for which algorithms we want to use, but based on some preliminary research, we think region-based convolutional neural networks is a good starting point for object tracking. If that fails to work, we'll explore other algorithms!

Baseline
Our baseline is the person-following behavior -- we conveniently already have three sets of person-following, non-machine-learning code, so it should be easy to make comparisons. If modified this code should work for neato-following.