Project Proposal: Search and ~~Rescue~~ Destroy

COSC 81

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Topic Summary

- Search and Destroy bot is a program that will drive around and map a space, then subdivide the room into cells
- Using the new map, the robot determines the best way to travel all rooms then determine the most optimal way to travel around the space and avoid obstacles (global planning)
- If the robot's camera finds any moving obstacles, or obstacles that were not there before, it will follow the moving obstacle around and chase it away (local planning)

Motivation

- Many malicious students roam Sudikoff at night
- Search and Destroy bot protects Sudikoff from dangerous CS majors
- Other uses apply to small children and pets
    - Example: Patrolling room to make sure pet cats don’t jump on furniture

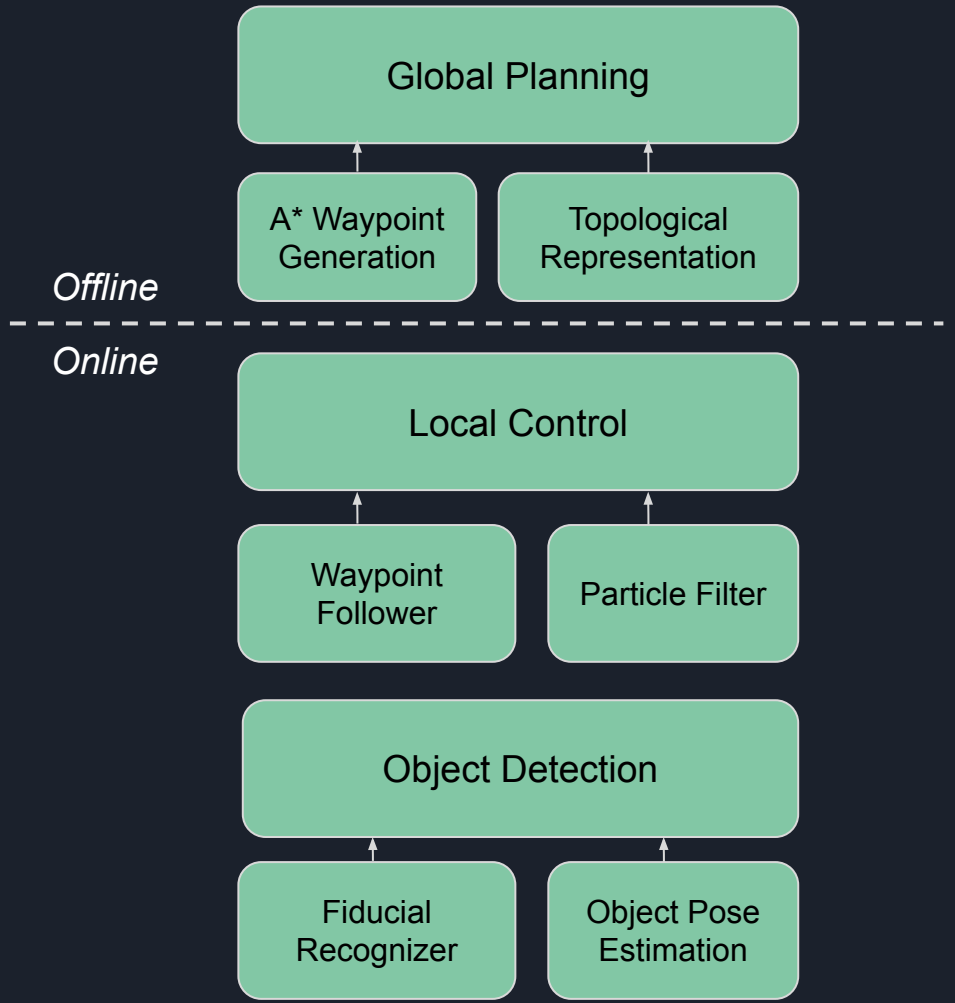
Approach

Offline:

- Divide an map into rooms
- Plan routes between them
  - Set a ‘goal’ in each area to explore and use A*

Online:

- Localize the robot (possibly updating the map as well)
- Follow the global plan and navigate obstacles
- Search for the objects and relate them to the robot
- Deal with obstacles



Evaluation and Metrics

- Completeness in mapping room
- Efficiency of patrolling through room
  - Compare with other programs already implemented:
    - Search (DFS, A*), Random walk
- How well the camera is able to recognize moving targets
- Can it be used in different environments

Breakdown

- Make robot drive around and map a space
  - Isaac
- Cluster cells of mapped rooms and find optimal way to patrol
  - Sherry
- Localize robot, camera
  - Pratinav
- Recognize and deal with moving obstacles
  - Elliot

Roles are not completely set and are subject to change