CSE 180 - Robotics
Final Project

Team Alpha

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Outline

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3. Testing/QA

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5. Team Member Work-Log

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Documentation

In order to produce a complete and sound solution to the task of detecting treasures along an arbitrary map, an approach was devised such that the computations performed by the robotic alogirthms would be distributed. In this manner, the initial implementation of this approach involved the construction of two nodes, **nav.cpp** and **treasures.cpp**. Therefore the two nodes would generate functionality in tandem with each other.

further improvements are specified in the **Design Decisions** *section.*

The primary data structures utilized in the formulization of this distributed approach were a one dimensional array as well as a map with a **string** type as the key and a pose object as the value. The simplification of storing a **pose** object within the map was predominantly related to its dependance on the ROS structs **point** and **quaternion** for the computing of the translation and rotation of the robot, respectively. The instantiation of the map constructor is demonstrated below with the **treasures** label:

$$\text{STD::MAP} < \text{CHAR}[], \text{POSE} > \textbf{\textit{treasures}}$$

Furthermore, by subscribing to the *map* topic it becomes possible to retrieve data embedded in the ROS message:

$$\text{NAV\_MSGS/OCCUPANCYGRID}$$

which contains the HEADER HEADER, MAPMETADATA INFO , and INT8[] DATA fields. The MAPMETADATA INFO field provides information regarding the height, width, and resolution of the environment map. The height, width, and resolution are defined as follows:

$$\text{UINT32}[] \text{ HEIGHT}$$
$$\text{UINT32}[] \text{ WIDTH}$$
$$\text{FLOAT 32 RESOLUTION}$$

With these variables, objects, and data structures . . .

Design Decisions

to be completed upon final submission of the source code . . .

Testing/QA

Treasures

to be completed upon final submission of the source code . . .

Navigation

to be completed upon final submission of the source code . . .

Team Member Work-Log

Christine Breckenridge

- Treasures

Aleksandr Brodskiy

- Documentation

Carlos Martinez

- Navigation

Conclusion

to be completed upon final submission of the source code . . .