**CMPUT 412: Experimental Mobile Robotics**
Winter 2018
Competition #4
Date: March 29, 2018
Egg Hunting within a Known Map

Objectives: Use of robot localization, target search and docking operations in a solution to the object search application.

Procedure
Prior to the competition, your robot will first use ROS's GMapping to build the map of the competition environment, i.e., the open space on the north end of the second floor of CSC as shown in the map below. At the competition, your robot will be initially placed at a **random location** in the environment and then search for visual targets of multiple types (an AR code or UA logo) that are randomly mounted on the walls of the environment all at the same height. Each time a target is found, the robot needs to dock in front of the target and **sound a beep unique to the target type**.   A total of five visual targets exist in the environment. Docking is considered successful if the robot parks within a 50cm x 50 cm square in front of the visual target (as marked on the floor). Each robot will be allowed two attempts at the task, each lasting five minutes.   The sum of the points earned in the two attempts is used to rank the teams.
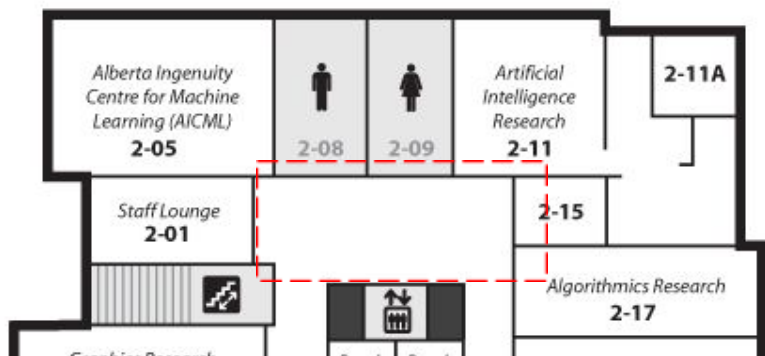
Marking Rules (Subject to Revisions)

- 5 points for locating a target, as indicated by coming to a full stop within 1m of the target
- 3 points for successful docking (1 point for clearing one side of the 50cm x 50 cm square)
- A minimum of 5 points required to qualify for the completion
- Tie-breaking based on time of completion if all targets are found within five minutes in both runs

Marking Scheme
Teams are ranked according to the point total. Upon successful qualification, the top ranked team will receive 100% of the marks, the 2nd ranked 95%, etc. Teams that are not able to compete (i.e. no targets found) will receive a 50% reduction, if the robot is able to navigate and search successfully (i.e. localise within the map, and begin navigating in a loop searching for targets).