Mobile Robotics Course Study Guide: Computer Science Section of Final Exam Fall 2009

The final exam is December 16th at 2pm

Note: Anything on the list is fair game, anything not on the list will not be on the quiz

Robot Control Architectures

- Deliberative/Hierarchical Control Architecture: What is it? Good points. Bad points.
- Reactive/Behavior Based Architecture: What is it? Good points. Bad points.
- Different methods for coordinating behaviors in a reactive/behavior based control architecture: competitive (action selection, voting method, subsumption), cooperative (behavior fusion).

Localization and Navigation

- What are some difficulties with localization?
    - Define: sensor aliasing, sensor noise, dynamic environments, unanticipated events
- Create a C-space and a map using one of the different kinds of map representations: regular grid, meadow map, quadtree.
- What is a topological map representation; kinds of landmarks (natural, artificial, passive, and active); what makes a good landmark? (perceivable, persistence, distinct, unique).
- Know how to do wave front planning.
- Know how to do an A* search
- Know how to do Breadth First Search and Depth First Search.

Image Processing & Vision

- What is an image? What is a pixel?
- What is visual erosion?

Sensors & Sensing

- Define *transducer*.
- Define the classes of sensors: proprioception, exteroceptoin, exproprioception. Give Examples
- What is the difference between an active and passive sensor? Give Examples.
- What is *active sensing*? Give an example.
- Describe *sensor fusion*. Give examples of the different types other than the one given in class: *redundant, competing, and complementary*.