

91.450, Robotics I
Prof. Yanco
Fall 2002

Sample Final Exam Questions

Following are some sample final exam questions from last fall's exam. Note that we covered different material this year than last, so some of the exam questions were deleted. You will have questions relating to the material covered in this semester's lectures and labs. Also, there is no robot coding in these sample questions, but you should expect to see it on the final.

Problem 1

Draw SENSE-PLAN-ACT diagrams for the three different robot control paradigms discussed this semester. Be sure to label each diagram with the name of the paradigm.

Problem 2

Define teleoperation and give an example of it in the robotic domain.

Define semi-autonomous and give an example of it in the robotic domain.

Define autonomous and give an example of it in the robotic domain.

Problem 3

What is an advantage of planning over reacting?

What is an advantage of reacting over planning?

Problem 4

Describe the difference between behavior combination in subsumption and behavior combination using pfields.

Problem 5

What is proprioception?

What is exteroception?

What is a passive sensor? Give an example.

What is an active sensor? Give an example.

What are the three attributes of a good sensor suite?

Problem 6

What does the “P” in PD control stand for?

What does the “D” in PD control stand for?

Explain how the “P” in PD control works.

Problem 7

Robots for urban search and rescue have been under development for the past seven years. Human rescuers and dogs are usually unable to enter a collapsed building until it has been deemed safe. However, robots could enter collapsed buildings more quickly to find survivors.

Design a sensor suite for an urban search and rescue operation. Explain your choices.

If you were designing a robot for urban search and rescue, which paradigm would you choose? Explain your choice.