

Homework 1

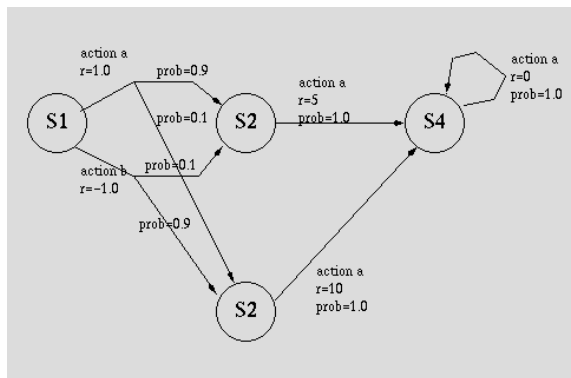
CS4630

Due Midnight Monday 22

April 17, 2002

1. List eight attributes of sensors that are important for robot designers to consider.
2. Instead of developing all these fancy localization algorithms, why don't we just use GPS to figure out where we are? Give two situations where GPS is not a good solution.
3. Many roboticists do not feel that RGB is a good color space for tracking colored objects. Why? What is better? Why?
4. Name and describe the components of a Markov Decision Problem (MDP).
5. Give an example of a problem for a robot that is not an MDP. Be sure to make it clear why this is not an MDP; which assumption(s) is violated?

Consider the following diagram in the following questions.



6. What is the value of $T(S_1, b, S_2)$?
7. What is the value of $R(S_1, b)$?
8. Assume we are using the simple sum of all rewards as a measure of optimality. What is the optimal policy for this MDP?

9. What are the components of an experience tuple?
10. What is the Q-learning update equation?