Homework 1
Out: Wed. Jan 19, 2011
Due: Mon. Jan 31, 2011

Pick 6 of the following 10 questions and answer each one of them with several paragraphs.

1. In your own words describe what is developmental robotics? What is the main research hypothesis of this field of robotics? Does it make sense? Why?

2. Give at least three reasons why it is a good idea for robots to undergo a developmental period. Give at least three reasons why it is not a good idea for robots to undergo a developmental period.

3. What is Artificial Intelligence? How do we know when we have achieved it?

4. According to Hawkins, what are the common reasons used by AI researchers to explain the failure to achieve human-level intelligence in an artificial system?

5. What is the verification principle? What are its implications for robotics? Why should roboticists study philosophy?

6. What is the embodiment principle? What are its implications for AI?

7. Why is it difficult to explain how the brain works? According to Hawkins, the neocortical algorithm works virtually the same across all sensory modalities. If this is correct, then what are some of the implications for the field of robotics?

8. What is an invariant representation? How can it be learned? How can it be used?

9. What are the key characteristics defining auto-associative memory? Give two examples in which such a memory would be useful for a robot performing tasks in human environments.

10. What do Rene Descartes and James Cameron have in common? Explain.