COMP 150: Developmental Robotics
Homework 1
Due Thursday, Sept 21st

Pick 5 of the following questions. Your answers should be at least 2-3 paragraphs long.

1. What is the main premise / hypothesis behind the cognitive and developmental approach to robotics? What part(s) do you agree or disagree with?

2. What (if any) is the difference between learning and development? In the context of robots? People?

3. Consider the principle of subjectivity described in (Stoytchev, 2009). What does that principle imply about how robots that are physically identical can share learned knowledge? What about robots that are not physically identical? In your answer, consider whether the principle also applies to human development and discuss concrete scenarios as examples.

4. What type of things would a robot that operates in human-inhabited environments need to learn about physical objects? Pick one from your list and sketch out an experimental setting which would enable the robot to learn the target concept / skill / etc. You are not required to provide a specific technical approach, algorithm, etc. (though you're welcome to discuss them); rather, focus on the setting, i.e., the robot's environment and its interaction with it.

5. Do you agree with Brooks that he, along with everyone else, is in some sense, a robot? What do you see as the strongest point(s) he makes? Weakest?

6. Consider the type of symbolic representations discussed by McDermott (1981). What are some of the biggest limitations of such representations and what are perhaps some ways they can be addressed in the field of robotics?

7. What is "commonsense" and why is it so difficult to capture it in a computer program or AI agent?

8. Formulate a robot learning task using machine learning terminology. Describe what are the inputs? What are the outputs? Where does the supervision come from? How would you go about creating a dataset for your problem?