ComS 610as: Developmental Robotics
Homework 3

Out: Tuesday, November 8
Due: Thursday, November 17

Choose five of the following eight questions and answer them.

1. Compare and contrast the Nativist, Constructivist, Vygotskyan, and Interactionist approaches to spatial development as described by Newcombe and Huttenlocher in "Making Space."

2. Newcombe and Huttenlocher describe four competing systems for spatial learning. Pick your favorite system and sketch how it can be implemented on a robot. If you don't like any of the four systems then suggest a new one.

3. Both humans and animals seem to represent their body movements in terms of multiple body-centric frames. Gallistel (1999) argues that the ability to reason with and convert between these body frames is one of the hallmarks of intelligence. Do you agree with him? Please elaborate.

4. What is sensory substitution? Give two examples. Why do you think sensory substitution is possible? Relate your answer to some of the current theories about this phenomenon (e.g., Hawkins' or O'Regan & Noë's).

5. Summarize the main points of O'Regan and Noë's theory. What aspects of their theory do you like the most? The least?

6. What are qualia? Psychologist and philosophers love to argue about the nature and causes of qualia. Do you think that this argument is relevant for robotics as well?

7. Summarize the main contributions of Pierce and Kuipers (1997). What would you do differently if you had to solve the same problem? What would you keep the same?

8. On his website (http://www.stelarc.va.com.au/) Stelarc argues that the human body is obsolete. Do you agree with him? If you could leave your body behind for just one day what would be the alternative life form of your choice?