

**CS 7630: Autonomous Robotics  
Fall 2008**

**HW #1**

**DUE: Wednesday September 8, 2008**

1) Explain in one or two sentences each of the following terms:

1. reflexes
2. taxes
3. fixed-action patterns
4. schema
5. reactive
6. deliberative

For the first three, provide an example from biology \*other than those in the book\* and explain how it is useful for the organism's survival. (Expanded version of question 3.2 in Murphy's book)

2) Roboticists often mimic models of human and animal behavior. Explain why this is useful and explain what weaknesses exist in this approach. What are some problems to watch out for when doing this?

3) Define and then describe the term ecological niche. Describe how the term relates to robotic design. Relate the term to survival, both in the wild and in the marketplace.

Consider Sony's AIBO<sup>[1]</sup> and WowWee's Robosapien<sup>[2]</sup>. Sony's first AIBO was sold in 1999, four years earlier than Robosapien. Sony had sold about 150,000 AIBOs, but the production was suddenly discontinued in 2006<sup>[3]</sup>. On the other hand, in less than five years of its production, WowWee has sold more than five-million Robosapiens<sup>[4]</sup>. How is each robot's ecological niche the same? How is each robot's ecological niche different (again from the perspective of their niche)?

Do not just say how they are the same or how they differ. Describe how the similarities and differences influence the ecological niches for which the robots were designed.

Reference:

[1] <http://en.wikipedia.org/wiki/AIBO>

[2] <http://www.wowwee.com/robosapien/robo1/robomain.html>

[3] [http://www.news.com/Sony-puts-Aibo-to-sleep/2100-1041\\_3-6031649.html](http://www.news.com/Sony-puts-Aibo-to-sleep/2100-1041_3-6031649.html)

[4] <http://bits.blogs.nytimes.com/2008/01/08/ces-robot-death-match-irobot-vs-wowwee/index.html?ref=technology>

(Note: You can find more about those platforms on the internet.)