

Student Name: _____ Student ID # _____

UOSA Statement of Academic Integrity

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: _____ Date: _____

Question 1: Sensing and Acting in Reactive Robots (15 points)

A. Describe an example of sensor *fusion* in Jeeves. **Explain** why this is an example of sensor *fusion*.

B. Describe an example of sensor *fission* in Jeeves. **Explain** why this is an example of sensor *fission*.

C. Describe an example of *behavior* fusion in Jeeves. **Explain** why this is an example of *behavior* fusion.

Question 2: Implementing the Reactive Paradigm (30 points)

Consider any version (your choice) of the reactive robotics code we discussed extensively in class, based on the original code by Jones, et al. This code was written in IC which is a procedural language.

A. **Explain** one improvement to the code (unrelated to code reuse, see part B) you could obtain if you were to rewrite the code in an object-oriented language. (You do **not** need to rewrite the code. You only need to explain an improvement you would get **if** you were to rewrite the code.)

B. Would the object-oriented version of the code have any advantages over the procedural version of the code when it comes to code reuse? (For example, if I wanted to change the transmission of the robot, would I be able to reuse any more code from the object-oriented version than I would from the procedural version?) **Explain** your answer.

Question 3: Paradigms and Architectures (30 points)

Of the hybrid deliberative/reactive architectural styles described by Murphy (i.e., managerial, state-hierarchy, etc.), which is most similar to a *reactive* architectural style? **Explain your answer.**

Of the hybrid deliberative/reactive architectural styles described by Murphy (i.e., managerial, state-hierarchy, etc.), which is most similar to a *hierarchical* (functional modules) architectural style? **Explain your answer.**

Question 4: Hybrid Architectures (25 points)

Xavier is reported to have “virtual environment sensors” and “virtual movement sensors.”

A. How are these *similar to* the perceptual modules of reactive systems (such as potential fields, the **feelforce** module in the example of Brook’s subsumption architecture, etc.)? **Explain your answer.**

How are these *different from* the perceptual modules of reactive systems (such as potential fields, the **feelforce** module in the example of Brook’s subsumption architecture, etc.)? **Explain your answer.**