Reading Assignment 4

"Behavior-Based Robot Navigation for Extended Domains" by *Arkin*
"Life in the Fast Lane" by Jochem and Pomerleau
Due: *Wednesday, February 24th, 1999*

The following questions are intended to stimulate your understanding of the assigned reading material. Many of them have no "right" and "wrong" answers.

1. In Arkin's schema-based approach, each of several behaviors produces a vector along which it thinks the robot should travel. These are then summed to produce the actual motion vector. How is this approach different from the subsumption architecture? Can you see any potential problems with it?

2. Arkin mentions some possible weaknesses of the potential field approach in his paper. These are primarily cycles, maxima and minima in the potential field. Why might these not be a problem in practice, when working with a real robot?

3. During training ALVINN uses synthesised camera images to supplement its real experience. Why is this necessary? Do you think that this is a valid approach? Can you suggest any alternatives?

4. To achieve lane-changing behavior, ALVINN is presented with one or more "virtual images". Do you think that using artificial images like this is a reasonable approach? Is it a general-purpose one, or is it limited to certain environments?