

Assignment #1: Introduction to Behavior-Based Robotics

Overview:

In the spirit of Brooks's seminal work *Intelligence without Representation* (Brooks 1991), design and code-up a low-level reactive/behavior based agent and give your agent a name. Your agent will be placed into a tournament to compete with other tank agents. Your tank agent's goal is to be the last surviving tank agent or to have the most remaining health after a pre-determined time limit. Prior to the competition, you will submit a report on the design and coding of your AutoTank agent. Then you will give a 5 minute presentation discussing the high points of the design and the behavior-based architecture.

Requirements:

1. This assignment is individual work; you are responsible for creating your own agent.
2. Download and install the AutoTank environment with the Unified Behavior Framework in Unity 3D.
3. Get familiar with the software, read the documentation on the Unified Behavior Framework discussing how the bots are built (Woolley *et al*, 2007 & Woolley *et al*, 2009), how the behaviors are created, and how to build and create arbiters to match your behavior based architecture.
4. Complete the provided AutoTank tutorial.
5. Then select a reactive/behavior-based architecture and design a player for competition in the environment. The architecture you choose can be any reactive architecture you can find in the literature. You may combine multiple architectures, provided you can adequately describe how you combined them.
6. Start the code and iteratively improve until you are satisfied you have a good player. While doing this, do not break the rules of the reactive/behavior-based architecture you have selected (i.e. once complete, make sure what you have implemented actually demonstrates the chosen architecture). If you alter the agent, keep track of the alterations that you make in trying different things for your report.
7. Create a map for the environment. Use your imagination and there are no rules here. So, you can try and make it easy for your bot and hard for others.
8. Turn all deliverables into a ".zip" file and submit.
9. During class on we will place everyone's bots into the AutoTank ring and have them battle for 5 rounds. Can your bot be the sole survivor?

Deliverables:

1. All files that make up your AutoTank agent (i.e. all changes to the provided content).
2. Completed map file
3. Report (1-2 pages IEEE format)
4. Presentation and slides