



Final Demonstrations and Project
Behavior-Based BradyBot
(25% of Final Grade)

Description:

Each student team will demonstrate the features of their behavior-based BradyBot during week 10. The team will provide details of the methodology used to create the following behaviors: *avoid-obstacle, follow-wall, follow-center, follow-object, follow-robot, and go-to-goal*. The demonstration will be judged on the following 4 criteria: *creativity, flexibility, accuracy and reliability* of the design. During the oral presentation, the team members should demonstrate and highlight the robot features with these criteria in mind.

Schedule:

Date	Demonstrations	Time
Monday, 05/14/07	Follow Wall Obstacle Avoidance	6 minutes/ team
Tuesday, 05/15/07	Follow Center Follow Object	6 minutes/team
Thursday, 05/17/07	Go To Goal Follow Robot	6 minutes/team
Friday, 05/18/07	Wall Following Competition Follow Object Competition Follow Robot Competition	8:05 – 8:55 am 9:00 – 9:50 am 9:55 – 10:45 am

Presentation Order:

Date	Demonstrations						
Time	9:00	9:07	9:14	9:21	9:28	9:35	9:42
Monday, 05/14/07	Bobby	Carol	Greg	Jan	Marcia	Mike	Peter
Tuesday, 05/15/07	Jan	Marcia	Peter	Carol	Mike	Bobby	Greg
Thursday, 05/17/07	Peter	Mike	Marcia	Jan	Greg	Carol	Bobby

Friday Heats:

	Heat 1	Heat 2	Heat 3	Heat 4	Heat 5	Heat 6	Heat 7
<i>Time</i>	8:05	8:12	8:19	8:26	8:33	8:40	8:47
Wall Following	Bobby Carol	Greg Jan	Marcia Mike	Peter Winner of Heat 1	Winner of Heats 1 & 2	Winner of Heats 3 & 4	Winner of Heats 5 & 6
<i>Time</i>	9:00	9:02	9:14	9:21	9:28	9:35	9:42
Follow Object	Mike Greg	Marcia Carol	Peter Jan	Bobby Winner of Heat 1	Winner of Heats 2 & 4	Winner of Heats 1 & 3	Winner of Heats 5 & 6
<i>Time</i>	9:55	10:02	10:09	10:16	10:23	10:30	10:37
Follow Robot	Jan Peter	Bobby Mike	Carol Greg	Marcia Winner of Heat 1	Winner of Heats 1 & 4	Winner of Heats 2 & 3	Winner of Heats 5 & 6



Final project competitions:

1. Wall Following (2 pts on the final project to the team with the overall winner)

2 robots will race to accurately (~5 inches) follow the wall and avoid each other as well as other obstacles. The first robot to successfully circumnavigate the wall twice and return to the start position without hitting anything in the environment wins (see Figure 1).

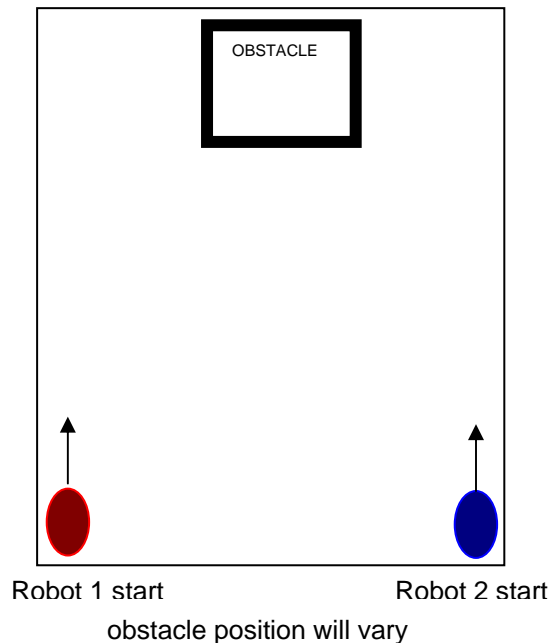


Figure 1: Wall Following Competition

2. Follow Object (3 pts on the final project to the team with the overall winner)

2 robots will race down the center of a hallway and exit out of the other end. The robot should then detect and follow objects (i.e. pants leg, paper, hand, wooden block) within 5 inches of the sensors. The objects will direct the robot to the opponent's hallway. The robot will then follow down the center of the hallway to the opponent's start position. The first robot to reach the opponents start position without losing the object or hitting any objects or robots wins (see Figure 2).

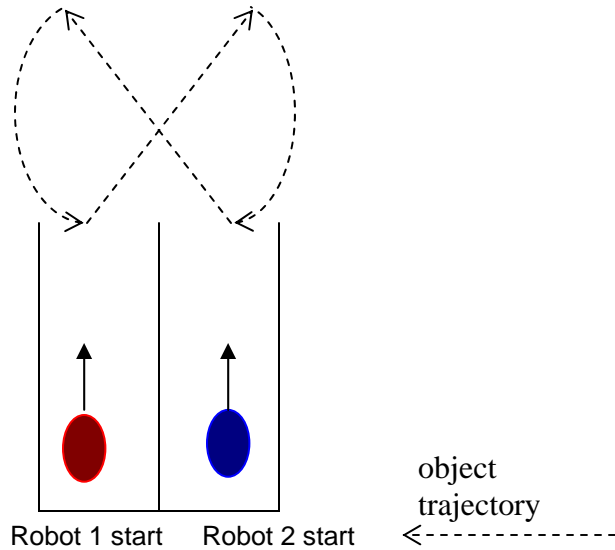
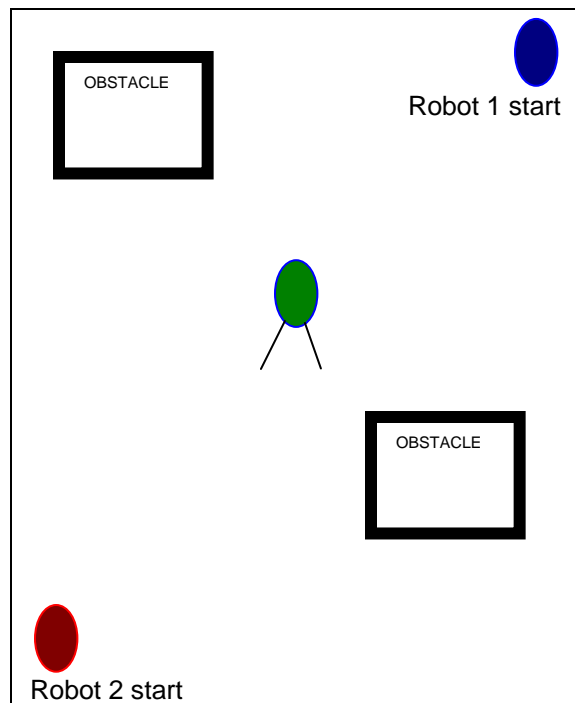


Figure 2: Follow Object Competition

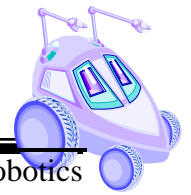
3. Follow Robot (5 pts on the final project to the team with the overall winner)

2 robots will wander through an unknown environment in search of a slow moving robot sending out a distress beacon. The first robot to successfully find the robot and move in line to follow behind the robot without hitting the robot or any obstacles wins (see Figure 3).



distressed robot and obstacle positions will vary

Figure 3: Follow Robot Competition



Grading Rubric:

Grade	Final Report (70%)	Final Project Oral Presentation and Demonstration (30%)
A	The project report is well-written and easy to understand. The technical descriptions are accurate and complete. (Definitions may be given to clarify ambiguities.) Data is presented in an easy-to-understand format (tables and/or graphs). Diagrams are labeled and clear. Grammar, typing, and spelling errors have been corrected.	The oral presentation and demonstration is done in a professional and organized manner, describing the main highlights and contributions of the project. The project shows creativity and substantial effort. Either good results have been achieved or there is an explanation and analysis of what went wrong and suggestions for improvements (i.e. all 6 of the behaviors work at some level). <i>creativity</i> – the robot uses the IR, receiver, and/or servo to find the goal and/or robots and moves smoothly to them, the robot can thoroughly wander through the environment <i>flexibility</i> – the robot can use the receiver to find objects in any direction and drive to them <i>accuracy</i> – the robot moves with relative accuracy to the neighborhood near the object and maintain a distance of 5” from the robot <i>reliability</i> - the robot does not fail, get stuck , hit walls or obstacles, and is able to find the goal or robot
B	The project report is reasonably well-written. The technical descriptions are accurate and complete, although there may be some ambiguities. Data is presented in an easy-to-understand format (tables and/or graphs). Diagrams are included. Most of the grammar, typing, and spelling errors have been corrected.	The oral presentation and demonstration is done in a professional manner, describing the main highlights of the project. The project shows good effort. Acceptable results have been achieved or there is an explanation of what went wrong (i.e. only wall following, obstacle avoidance, follow center and follow object work). <i>creativity</i> - the robot uses the servo to find objects or walls and moves smoothly between walls and behind objects <i>flexibility</i> – the robot can follow objects from either side and in any direction <i>accuracy</i> – the robot maintains a path equidistant from both walls most of the time, the robot maintains a 5 inch distance from found objects most of the time <i>reliability</i> - the robot does not fail, get stuck, hit walls or obstacles, or lose the object
C	The project report is included but parts of it are not easy to understand. The technical descriptions may be inaccurate or incomplete. Some data or diagrams may be missing. The report includes grammar, typing, or spelling errors.	The oral presentation and demonstration is done in a professional manner, but is difficult to follow or does not include significant details. The project shows reasonable effort, but produces limited results (i.e. only wall following and obstacle avoidance work). <i>creativity</i> – the robot uses the IR and servo to find and follow walls smoothly <i>flexibility</i> – the robot will follow the wall on either side and will find a wall when it is not near one <i>accuracy</i> – the robot maintains the 5 inch distance most of the time from the walls and obstacles <i>reliability</i> – the robot does not fail, get stuck or hit walls or obstacles
D	The project report is included but is difficult to understand. The technical descriptions may be inaccurate or incomplete. Data or diagrams may be missing. The report includes numerous grammar, typing, or spelling errors.	The oral presentation and demonstration is done in an unprofessional manner. The project shows a lack of effort and produces poor results (i.e. one of the 6 behaviors works).
F	The project report is not included.	The oral presentation and demonstration is done in an unprofessional manner. The project shows a lack of effort and produces poor results (i.e. none of the 6 behaviors works).