Homework Week 03 – Sensor Programming and Trade Studies

Due Week 04

1. The “Turn-Left” algorithm is a classic way to solve mazes. The robot begins by following a wall. Every time the robot detects an opening, steer the robot left. The net effect is that the robot should reach the end goal and complete the maze. Construct a simple maze – perhaps with stacks of books. Using a Lego-based robot (e.g. Trikebot or Tribot) and Lego sensor(s) e.g. ultrasonic and/or touch sensor, use NxC to program a “turn-left” algorithm and complete the maze. Post a video of your robot successfully navigating your simple maze, on your team’s web site. Refer to the 2-part article posted on the course web site for more information.

2. Search the web for 10 articles (preferably from technical sources like IEEE and ASME) that describe game strategies (e.g. offensive, defense, scoring, etc) After reading each paper answer the following:
   A. Scan (or sketch if no figure available) game strategies e.g. how are robots commanded into positions in order to score, pass, block, etc.
   B. Write 1-paragraph that describes the game strategies used in the paper
   C. Write 1-paragraph that describes how successful the strategy worked (e.g. did that team win any games) and what the aspects that you like and dislike about their strategies

On your team’s web site use a section heading entitled “Literature Survey: Game Strategies” and post
   - PDFs of the 10 articles and/or URLs for these articles
   - Answers to 2A, 2B and 2C for each article

3. Create a 10-min PowerPoint slide presentation (approximately 10 slides). Your team will present this privately to the instructor during next week’s session. The presentation should include:
   A. Technical Design Requirements and Trade Studies on your robot’s mechanisms (e.g. for passing, blocking, receiving)
   B. Your team’s concept. Provide sketches and/or sample Lego constructions and/or demonstrations for mechanisms

In ENGR-102 (winter-term) a PPT lecture that discusses Technical Design Requirements and Trade Studies was presented in lab sessions. A copy of this lecture is posted on our course web site. Use this lecture material as a guide to creating your own answers to 3A.