

IEEE Robot Project Analysis

Project Planning and Team Structure:

This is where a majority of the problems on the IEEE robot project began, and unfortunately, this area had a negative effect on the entire project itself. Although there were numerous student participants (initially) for the robot project, there was a lack of coordination and planning. The design meetings during the early stages of the project were usually unorganized:

- No structure of leadership
- Unorganized discussions (multiple discussions at once, and some ideas were ignored)
- Lack of interest among certain students
- Poor management (tasks were given out to students, but were not followed up to see if completed)
- No time table for designing and developing the robot

None of the problems listed above were addressed during the early stages of the robot development, and this led to numerous students to drop out of the project.

Low Priority Project:

The IEEE robot project was a low priority project for the students. There was no drive for some students to see this project succeed (no consequences or incentives). A lot of students participating on the project during the early stages also underestimated the spring semesters work load. As the tests and projects began to build up, many students who wanted to participate were forced drop out.

Design Problem:

The overall construction and programming of the IEEE robot was quite successful. There were, however, design flaws that caused some major problems during the competition.

The line following sensors designed for the robot is a good example. The line following sensors was not properly calibrated to run on the boards provided at the competition (a PID controller should have been implemented in the design). Interference from cameras as well as light fixtures was also not considered during the implementation of the sensors. The failure to properly calibrate the sensors as well as taking the running environment into account led to three unsuccessful trails.

Another questionable design choice is the stepper motors used for the robot movement. The robot was designed only for single block pick-up, making speed an important factor in winning the competition. Stepper motors are design for control and precision, not for speed. A more reasonable choice would have been a DC motor connected to a motor controller (use PWM for speed control).

If those two major design issues were addressed during the early stages of the robot construction, there would have been a good chance of a win at the competition. But due to the lack of time and manpower, the two issues were not properly addressed (more emphasis was put on constructing the final product and getting the robot working as fast as possible).