CPE 470: Auto Mobile Robotics

Team 4

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The overall goal of this project was to have our custom built robots circumnavigate through a maze autonomously, and find its way back out. The little autonomous car is custom built from Legos and powered by the Lego NXT Mindstorm. The only form of sensing the robot has is ultrasonic sensing, or sonar sensing, and operates on two motorized wheels and one small stabilizing wheel. Conceptually the task seemed simple to overcome, to have a little robot run through a maze and come back out, but of course, coding is never that simple. The robot itself was a wild success as we took first place in the competition! But the journey to get the winning robot was definitely challenging.

The initial hard ware design was challenging. My partner and I were half tempted to hire a mechanical engineer to build the robot for us, but then where is the fun in that? Our little robot effectively went through three designs. The first design was a rehash from our old design. We thought we were able to just recycle our old robot design and program around that. Our old robot design did not support two ultrasonic sensors though, so we had to go back to the drawing board. Our next design was a lightweight racecar with minimal crossbars on it to keep it light and mobile. Upon completing the car, we realized that there was no place for the sonar sensors. The car was only able to hold the NXT. So after slight modification to our sports car we were able to make more of a hummer style car that was able to hold the two sensors we needed, and possible any other sensor we will need in the future.

After building the robots, we now need to program it and give it character. The programming of the robot was surprisingly extremely hard. It took us roughly five to six hours to write 60 lines of code. The code itself is very responsive, but prone to be stuck in a loop. My partner and I were unable to figure out a way for a failsafe function to have it turn around and run out of the maze if it got stuck. The code still proved true however as it carried us to first place in the competition.

I am excited to see how our little robot will do in the coming competitions, I have faith that our little Wall-E will take first in every competition. Below is a picture of our robot before the competition.