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| Laboratory 2:  Controlled Robot Movement SEG4145 Feb 12, 2015 Martin Moncion 6146324 Jeremy Sivaneswaran 3116318 |
| Objective The objectives of this lab are to read and process sensor data in real time and control the movements of the robot in a precise manner. Design and Algorithms The design of our system is very minimalistic, there are a few methods for the different types of movement necessary and a few to perform output.  The algorithm used is a bit more complex. We used simple arithmetic to determine how far a wheel must return to reach certain distances. For example when moving parallel to lab tiles the wheels need to rotate through 113 sensor changes, diagonally 160 changes and to rotate 45 degrees they need to move through 26 changes.  By constantly reading from each sensor and maintaining a synchronized count we shut down or restart a corresponding wheel motor that is out of sync. Discussion We did not run into many problems during this lab. The only issue we feel we faced is that it is very hard to throttle these motors, because they essentially only have two speeds (forward and reverse), the best we could do is start and stop a motor, which leads to very shaky and uneven movement. If we had more precise control over the motor we would be able to have even more precise results and much smoother motion.  The servo library allows for much greater control over the values sent to an attached device when compared with analogWrite. The servo write commands allows us to use Pulse Position Modulation which allows for greater control over the pulse timings sent to the attached device. analogWrite uses Pulse Width Modulation only which varies the on-time/off-time ratio to control the overall signal sent to an attached device. |