# **IEOR 140 Project 1 - Geometric Shapes Tracer**

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**Brief Description**: This project includes three milestones. Our robot traces a square using the RegulatedMotor interface two times, then do it another two times in the opposite direction in Milestone 1. The objective is then repeated in Milestone 2, the difference is that we use the DifferentialPilot class here. In Milestone 3, we have our robot traces polygons and circle's arcs.

**Most difficult part of the project**

We found the most difficult portion of the project was dealing with problems regarding buggy rovers. Also, figuring out the API between all four of us was quite the task. The next problem we ran into was installing leJOS software on our separate computers. While working on the first milestone (tracing a square) our group ran into some issues attempting to move forward a specific distance and then stop and rotate. As a group we brainstormed ways to move a constant distance which included multiple ways where we finally decided on one algorithm.

**Most interesting part of the project**

Our group found that the most interesting part of the project was the data abstraction used by the DifferentialPilot. We found the DifferentialPilot very interesting and worthwhile to implement. When we first began coding the "Trace a Square" milestone, we were simply using rotate and forward methods which was much more difficult than using the DifferentialPlot.

**Approximate error in distance and angle**

We experienced a negligible error in all distances. The left turn angle in SquareBot has a worse error than the right turn angle. The pentagon, triangle, and respective circle angles all executed swiftly.

**Most significant sources of uncertainty**

### The most significant sources of uncertainty for our group was dealing with a broken LCD screen. Without having the LCD, our Robot was not able to give us the necessary feedback. This left our group guessing and forced us to use the computers output to determine where our errors were occurring. However, Professor Glassey was able to fix our screen over the weekend which helped us regain focus and continue to push on with our milestones.

### **Conclusion**

### In conclusion, we found this Project to be a great introductory into using and familiarizing ourselves with the leJOS API. Moreover, working through the logic of completing each milestone helped our group become a more cohesive unit. We broke our work into portions and used online repositories to update code and keep all group mates on the same page.