

Autonomous Polyurethane Applier



Picture Taken By: Dae Yon Jung

TEAM

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Under Supervision Of

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Mechanical Engineering
08/13/04

Introduction

Problem

- Polyurethane is a potentially hazardous chemical, while applying its fumes can cause irritation to the eyes, nose, and throat (BEHR Process Corporation).
- In addition, applying polyurethane to floors is a tedious task

Solution

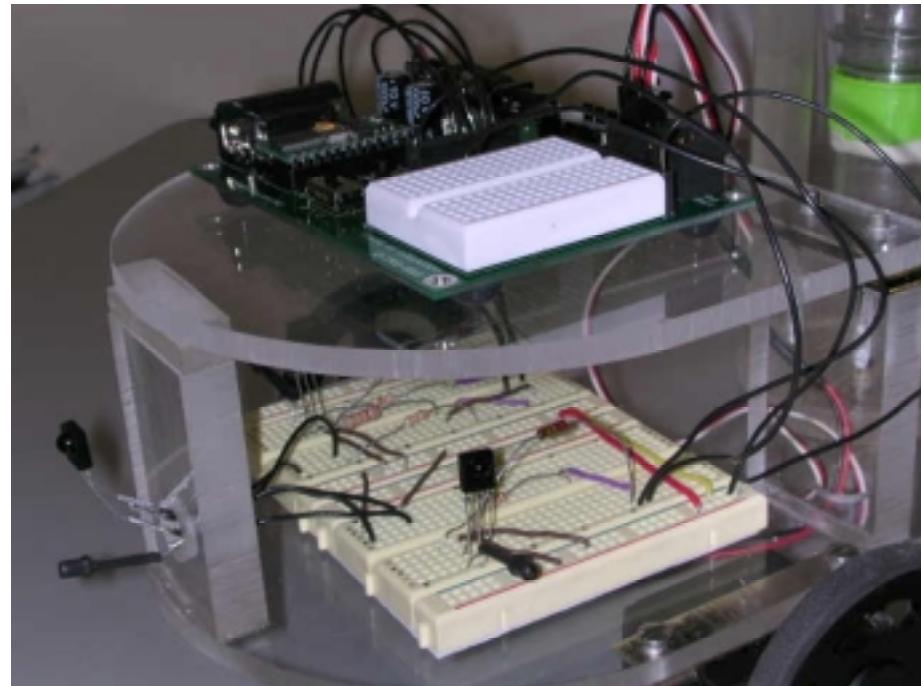
- Polyurethane could more safely and easily be applied by a robot.



http://www.perfectimagefloors.com/images/Floor_w_Chair1.JPG

Components

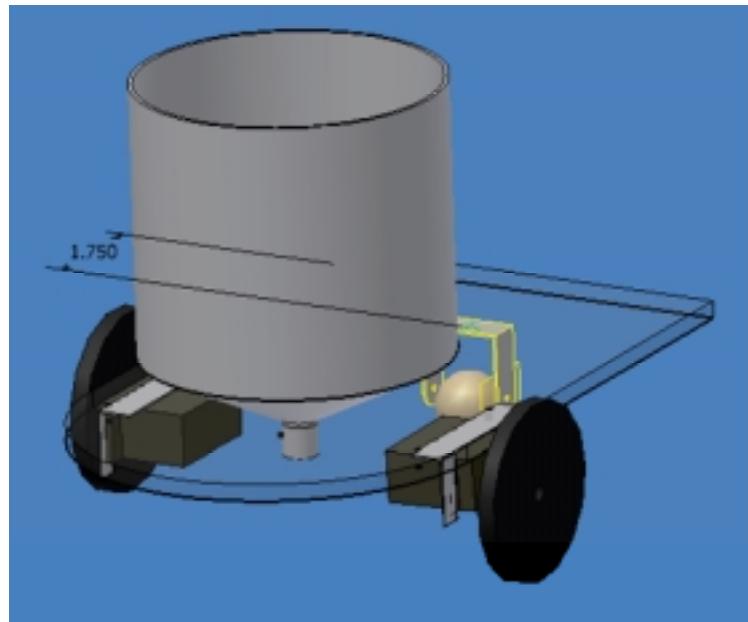
- Basic Stamp II (BS2)
- Plexiglas chassis
- 5 Infrared Sensors
- Servo motors
- Paint Roller
- Water tank



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Design Overview

- The design currently includes the following features:
 - Pre-programmed application patterns.
 - Infrared sensing and course correction.
 - Fixed polyurethane flow-rate.
- We hope to make the following additions:
 - Electronically actuated polyurethane flow-rate.
 - Back-tracking avoidance system.

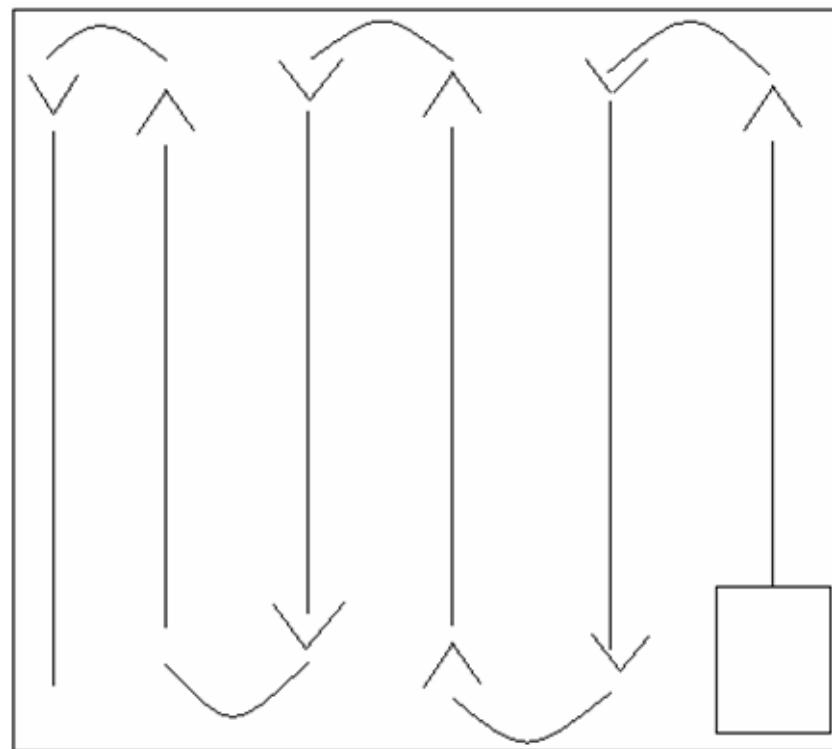


AutoDesk Inventor Design By: Heejae Kim

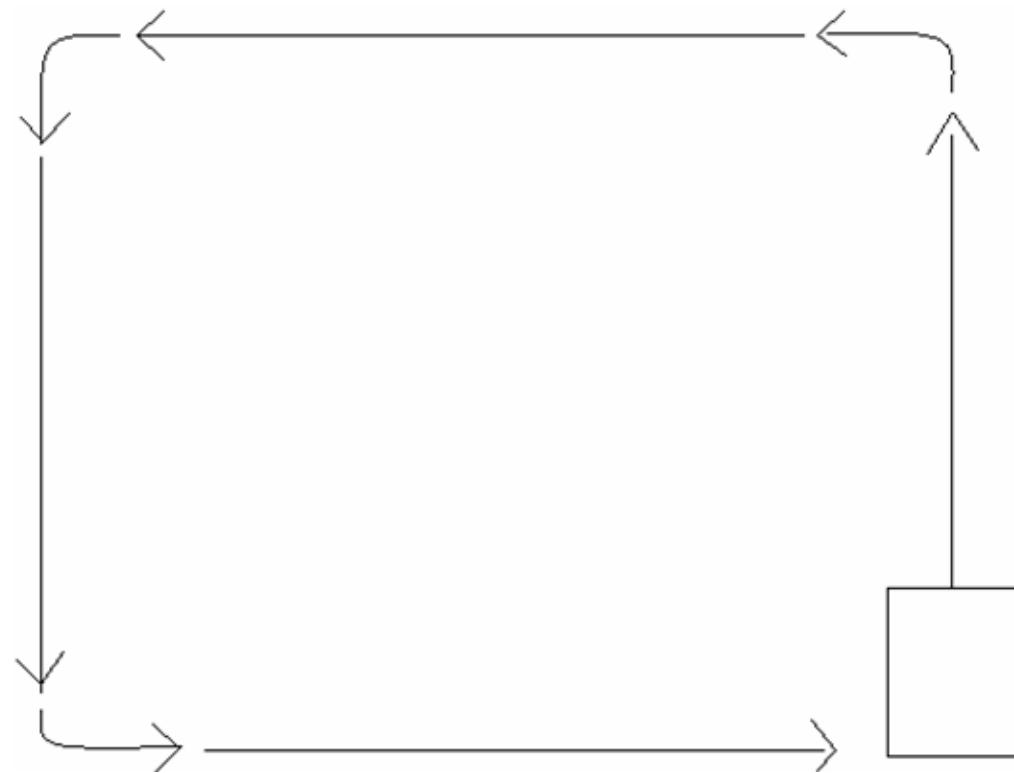
Pre-Programmed Application Patterns

- A set of instructions for navigating specific trouble spots.
- Instructions for navigating corners and completing turn-a-rounds without backtracking.
- Useful for difficult maneuvers.
- Lack the ability to adjust for imperfect environments.

Area cover program



Wall following program



Infrared Sensing and Course Correction

- Sensors detect objects in the vehicles path by transmitting and receiving infrared pulses.
- Allows the addition of variation to the pre-programmed maneuvers.
- Enables operation in varied environments.
- Necessary for practical application of polyurethane applicer.



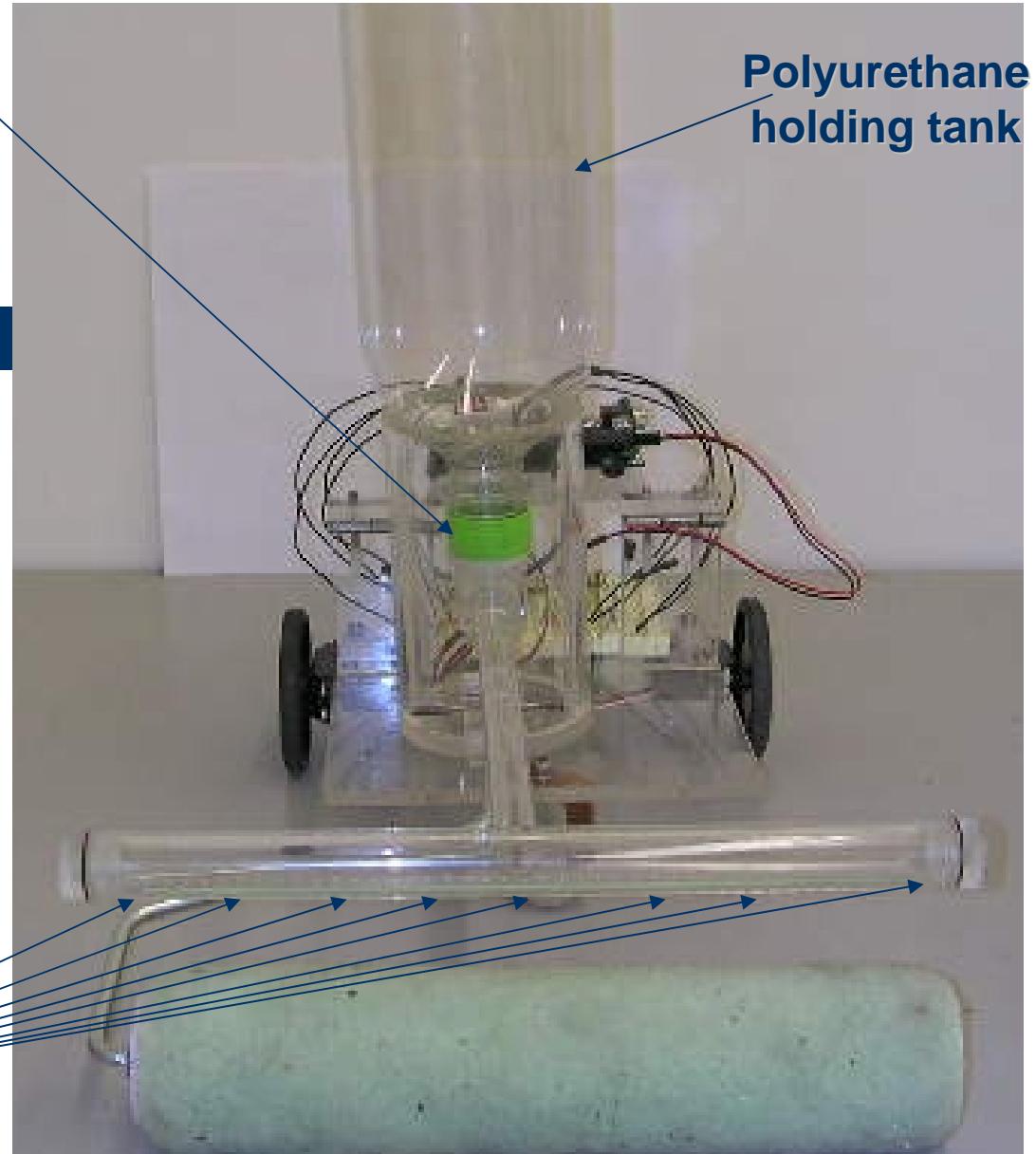
Fixed Polyurethane Flow-rate

- Extremely simple to implement.
- Uses polyurethane inefficiently.
- Does little to ensure even coverage of a given area of floor.

Fixed Polyurethane Flow-Rate System

Polyurethane
drips from small
holes along
bottom of
Plexiglas tube.

Gravity facilitates
fixed flow-rate
through a simple
nozzle.



Team Work Applied

- Dae Yon Jung - Programming, circuit building, Building Robot
- Heejae Kim - Testing, Building robot, Programming
- Eric Waller - Programming, Robot Design, building Robot
- Sahil Kohli – Robot Idea, Robot Design ,Building robot

Acknowledgements

We would like to thank:

- Professor Vikram Kapila
- Mr. DongYoung Ko
- Mr. Alessandro Betti
- The YES Program