

# Autonomous Polyurethane Applier



Picture Taken By: Dae Yon Jung

## TEAM

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## Under Supervision Of

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# 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

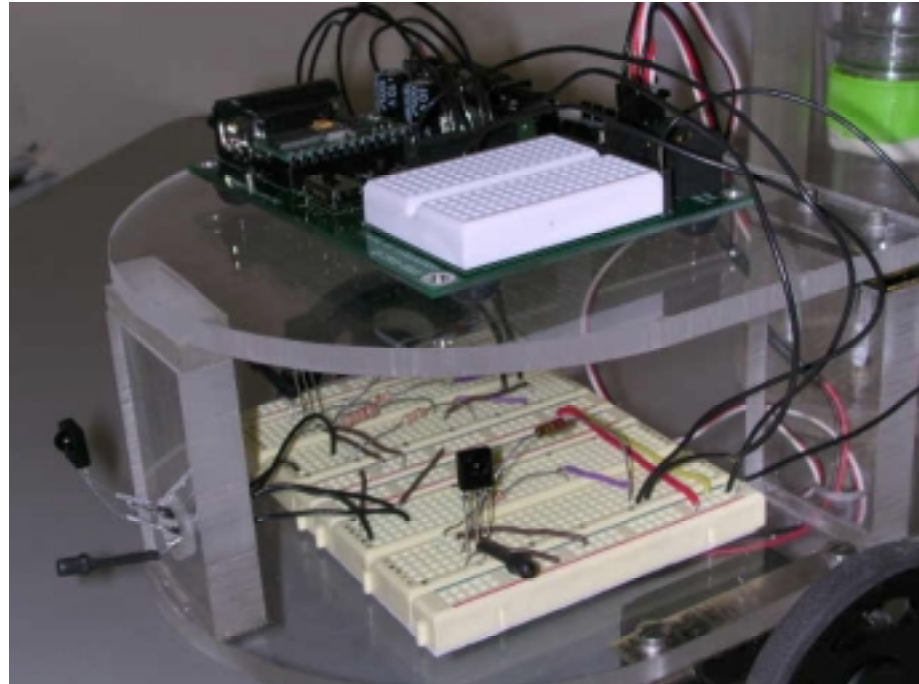
- Polyurethane could more safely and easily be applied by a robot.



[http://www.perfectimagefloors.com/images/Floor\\_w\\_Chair1.JPG](http://www.perfectimagefloors.com/images/Floor_w_Chair1.JPG)

# Components

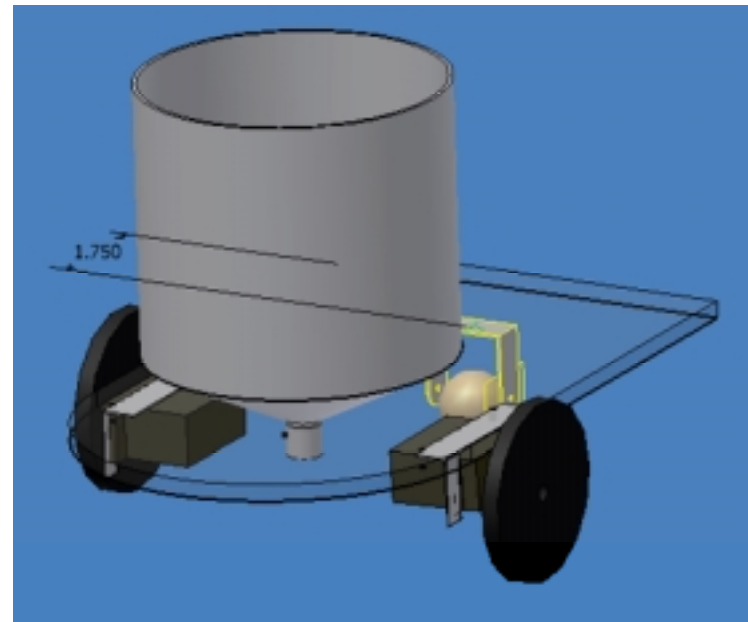
- Basic Stamp II (BS2)
- Plexiglas chassis
- 5 Infrared Sensors
- Servo motors
- Paint Roller
- Water tank



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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.

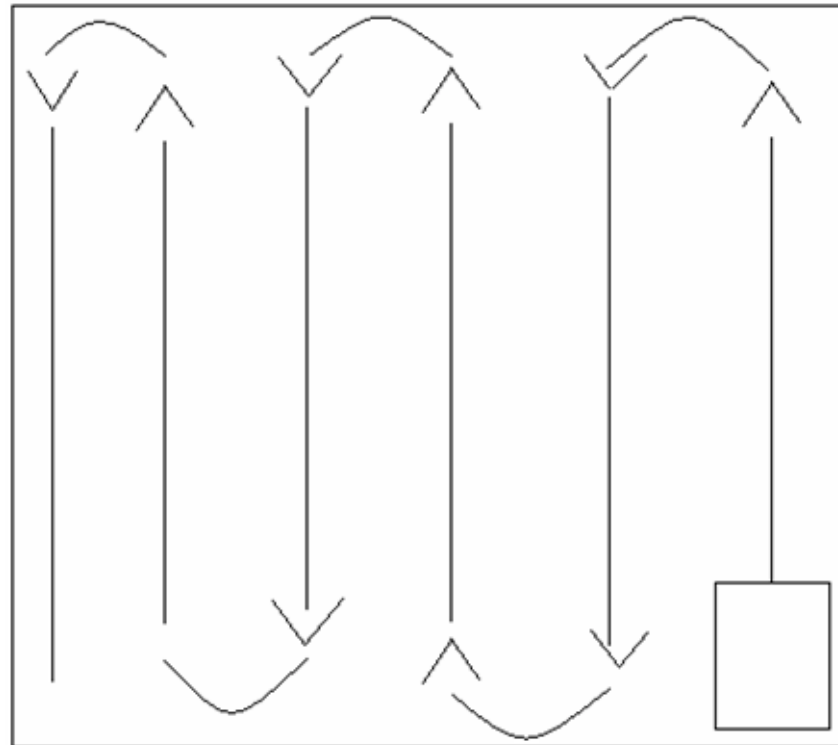


AutoDesk Inventor Design By: Heejae Kim

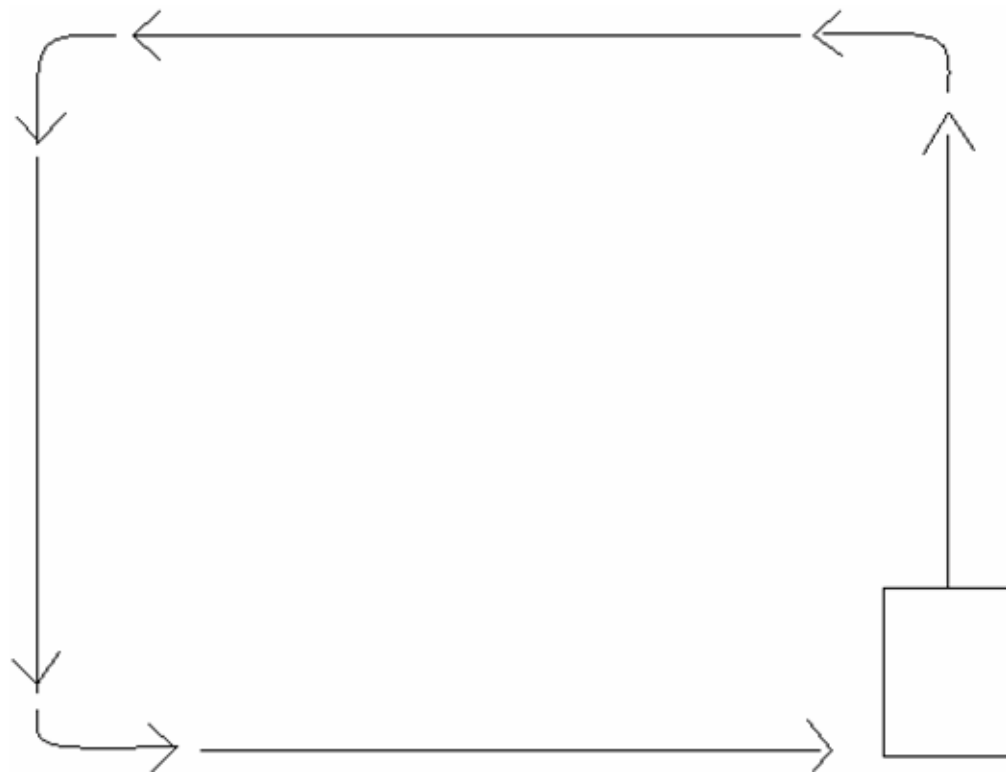
# Pre-Programmed Application Patterns

- 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 applier.





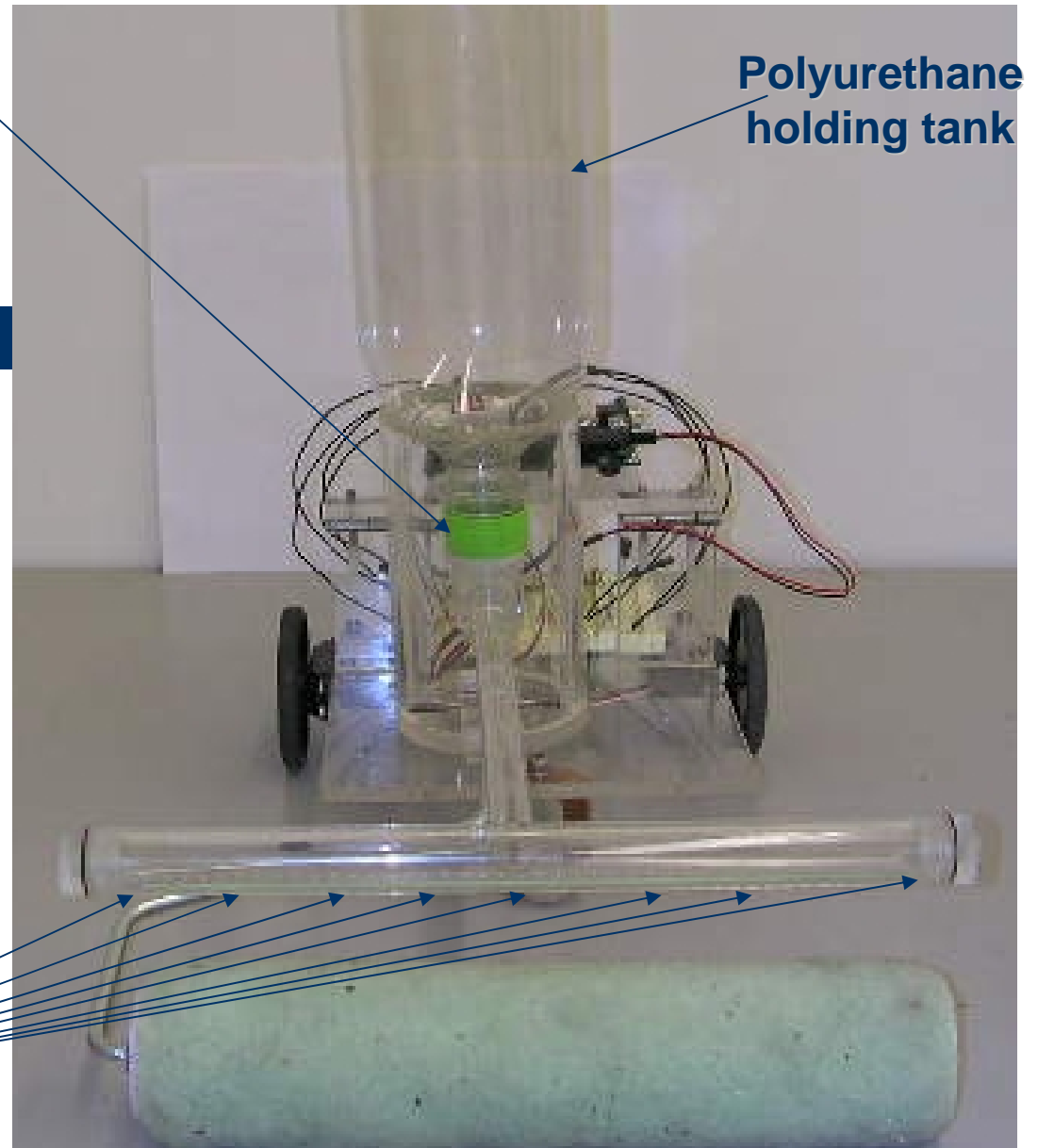
# Fixed Polyurethane Flow-rate

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

Gravity facilitates  
fixed flow-rate  
through a simple  
nozzle.

# Fixed Polyurethane Flow-Rate System

Polyurethane  
drips from small  
holes along  
bottom of  
Plexiglas tube.



Polyurethane  
holding tank

# 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

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