Proposed Solution

- Couple of transformations, including:
"Coordinate Transformation" proposed in George Collins' book, where
$x_{gl} = x_l\cos(\text{heading}) - y_l*\sin(\text{heading})$
$y_{gl} = x_l\sin(\text{heading}) - y_l*\cos(\text{heading})$, where $x_{gl}y_{gl}$ is the laser's coordinates in stage environment while x_ly_l the ones connected to robot's coordinate system

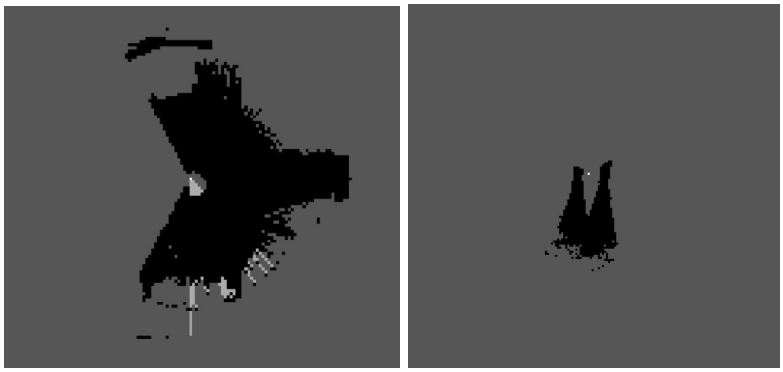
- Line drawing algorithm is implemented based on integer implementation of Bresenham's algorithm

Results

For stage simulation:
There are obvious incorrect free cells in the outputs, which haven't figured out yet how was generated.

Some of early stage results: very beautiful, meanwhile astonishingly incorrect. Though sometimes I would get results similar to the first image, which is clearly rotated by 90 degree.

For real data: (I am very confident that the result is not similar to what I was supposed to get.)



Problems Encountered and Solutions

- Starting very late
- Understanding the measurements of the given environments, such as the angle and coordinate values
- Adequate transformation implementation