Weekly report

1 My *Objectives* this week

- Loading windows on my Macbook
- Running Kilobots with windows
- Writing and simulating the algorithm of setting positions for two robots
- Adding a folder for Journal version of our IROS papers

2 Two Robots Positioning

2.1 Controlling Covariance

In this algorithm we want to control two position of two robots using friction. For ease of proof, we assume that we want to x position of the robots, and y of the robots are not the same and will remain the initial Δy as we go through the algorithm.

3 My *Accomplishments* this week

3.1 *Kilobots*

- I installed windows on my machine, and was able to see robots moving around and also communicating with each other.

3.2 *Algorithms*

- I wrote the algorithm with latex which works with all the possible positions that the robots may see.

4 My *Plan* for next week

- Complete the algorithm with Mathematica
- Trying to go to the light by installing Kilobotics platform.(Now our robots don't understand their libraries because of the k-team platform.

4.1 Meeting with Dr. Becker

- To see if my algorithm work and getting comments out of it.

Algorithm 1 Getting desired X-space

Require: Knowledge of the starting and ending positions of the two robots s_1 (topper robot) & s_2 (lower robot) & e_1 (topper robot) & e_2 (lower robot) and L length of the bottom wall. Current position of the robot will be showed as r.

Ensure: $\Delta y(t) = \delta y(0)$

$e_{1x} - e_{2x} = \Delta e_x$
$s_{1x} - s_{2x} = \Delta s_x$
loop
    if $\Delta x >= 0$ *AND* $\Delta e > 0$ **then**
        while $L - r_2 > \Delta e$ **do**
            Go left
        end while
        Go down until lower robot touch bottom wall
        if $\Delta e < \Delta x$ **then**
            Go left until $\Delta e = \Delta x$
        elseGo right until $\Delta e = \Delta x$
        end if
        Go to desired position
    end if
    if $\Delta x >= 0$ *AND* $\Delta e < 0$ **then**
        while $r_2 < \|\Delta e\|$ **do**
            Go right
        end while
        if $r_2 = L$ *OR* $r_1 = L$ **then**
            Go ϵ left
        end if
        Go down until lower robot touch bottom wall
        Go right until $\Delta e = \Delta x$
        Go to desired position
    end if
    if $\Delta x < 0$ *AND* $\Delta e < 0$ **then**
        while $r_2 > \|\Delta e\|$ **do**
            Go right
        end while
        Go down until lower robot touch bottom wall
        if $\|\Delta e\| < \|\Delta x\|$ **then**
            Go right until $\|\Delta e\| = \|\Delta x\|$
        elseGo left until $\|\Delta e\| = \|\Delta x\|$
        end if
        Go to desired position
    end if
    if $\Delta x < 0$ *AND* $\Delta e > 0$ **then**
        while $L < \Delta e + r_2$ **do**
            Go left
        end while
        if $r_2 = L$ *OR* $r_1 = L$ **then**
            Go ϵ left
        end if
        Go down until lower robot touch bottom wall
        Go right until $\Delta e = \Delta x$