Shiva Shahrokhi

Weekly report

1 My *Objectives* this week

- Showing mean position in code.
- Plotting different gain values and finding the best
- varying noise and see the influence.
- 2D control position
- What is better to control? Variance or standard deviation?

2 My *Accomplishments* this week

2.1 *Auto Controllers*

- different gain values.

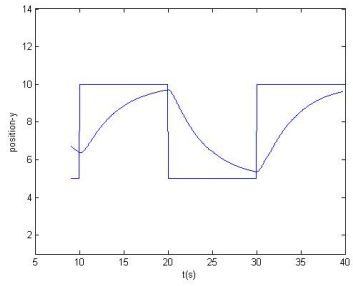

Figure 1: kgain 1 and derivative 1

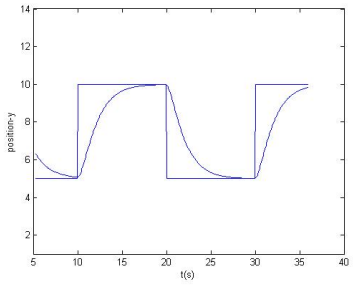

Figure 2: kgain 2 and derivative 1

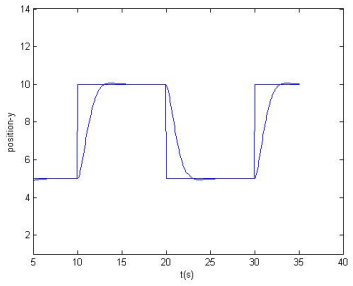

Figure 3: kgain 4 and derivative 1

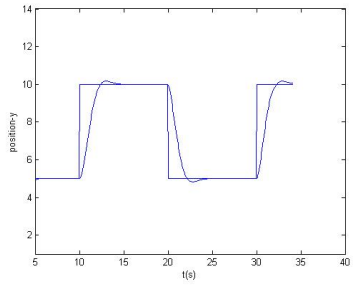

Figure 4: kgain 5 and derivative 1

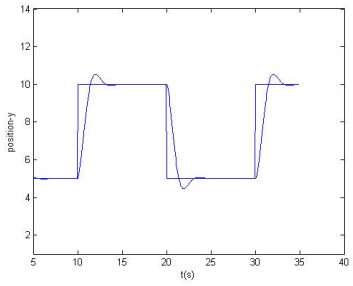

Figure 5: kgain 8 and derivative 1

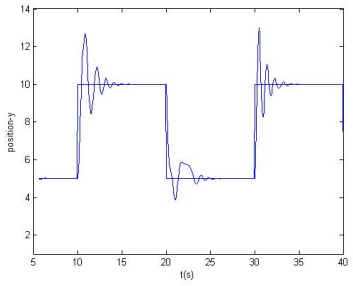

Figure 6: kgain 100 and derivative 1

I tested 20 trials to find the best kgain. And I found out that for the derivative of 1, the best gain value is 4.

- different gain derivatives. I tested with the gain value of 4:

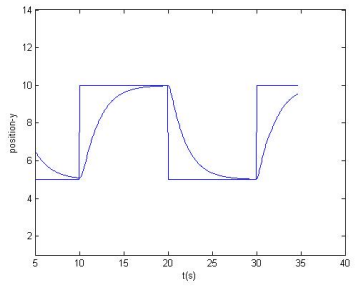

Figure 7: kgain 4 and derivative 2

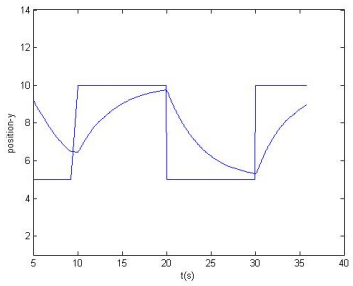

Figure 8: kgain 4 and derivative 4

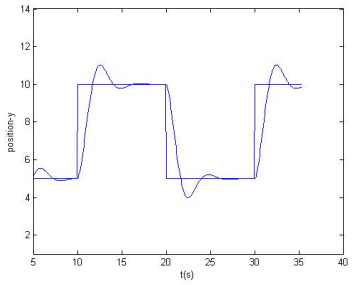

Figure 9: kgain 4 and derivative 0.5

It shows that for the gain value 4, the best derivative is 1.

- Varying Brownian Noise:

  For this purpose, I doubled Brownian gain and ran the code and waited a long time to see what happens gradually: As we can see in the images, the mean position of the x axis will

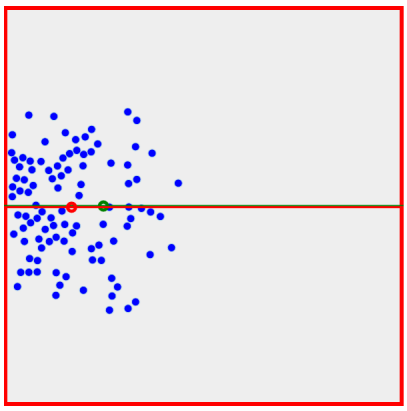

Figure 10: Brownian Effect after 11 seconds

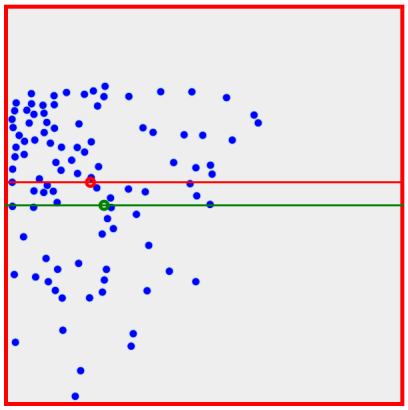

Figure 11: Brownian Effect after 45 seconds

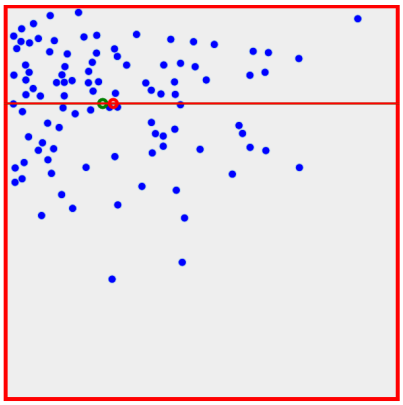

Figure 12: Brownian Effect after 86 seconds

  go to the center of the line gradually. After infinity we have the following image:

  which means that if we don't control it, it will spread completely.

- 2D control Now we can control mean of x too:

3 My *Plan* for next week

- Applying variance and covariance and standard deviation.
- Which one of them is the best?

3.1 Meeting with Dr. Becker On Wednesday 19th, 1 pm

- Deciding what to take for the next semester

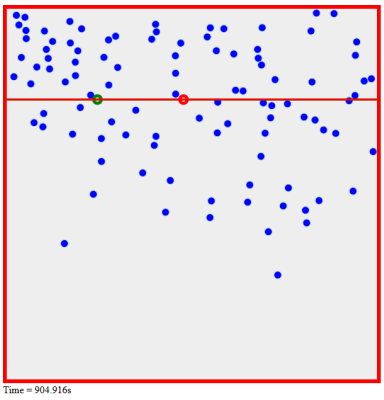

Figure 13: As t goes to infinity

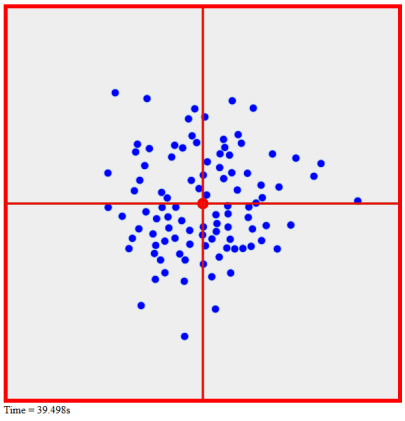

Figure 14: The goal position is 5 and 5

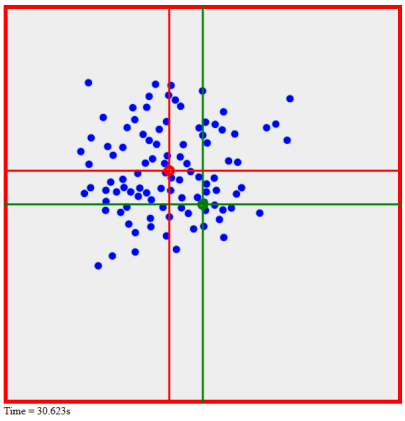

Figure 15: Going to the goal position

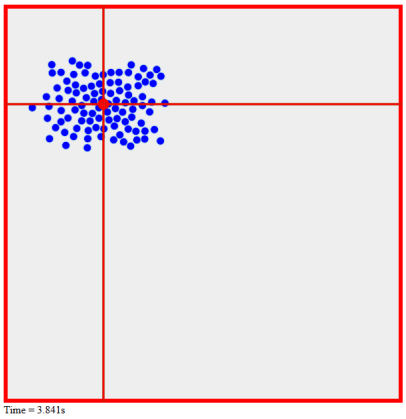

Figure 16: The goal position is 10 and 10

- What to survey for lab access
- Show him results.