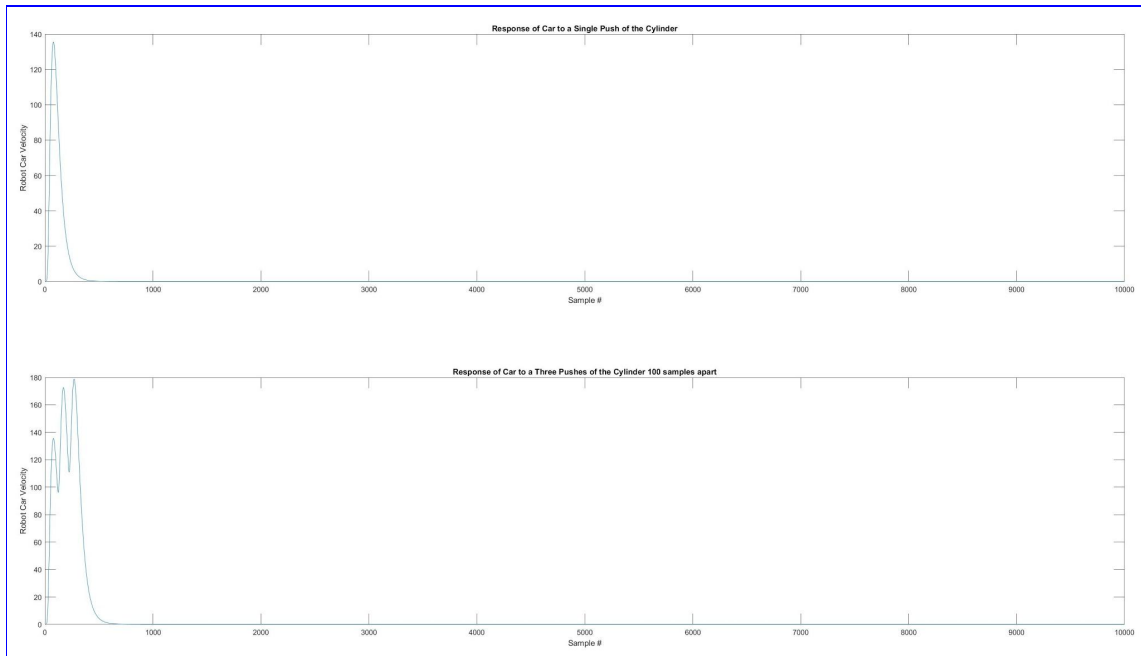


1) *Impulse Response: Plot of the impulse response you used*

`impulse_response = 15000*pdf(pd,x)'`



2) *Control Law: Brief description of the control law that you used*

$K_P = 5$; I chose the proportional gain to be 5 because when the value of K_P increases the speed of the control system responds better. The original value that was inputted created lag and would cause my mouse to shift back and forth. Changing it to an integer closer to 10 made the movement of the mouse a lot smoother.

Testing and Development

1) *Performance Criterion: Identify one performance criterion you experimentally optimized for your system (e.g. time it took you to move to a certain place on the screen; turning radius; etc.)*

The performance criterion I experimentally optimized for my system was how fast the system responds when I originally increase the speed of my agar.io.

2) *Experimental Parameter: Describe at least one experimental parameter you varied and at least two other parameters you kept constant for each experiment. You should test your system with at least five values of the experimental parameter, and perform at least 10 runs with each value of the parameter to characterize the performance.*

For my experimental parameter, I chose to change the impulse_response = {changevalue}*pdf(pd,x)' and keep the KP value constant at 5 and the Sample # at 1000.

Robot Car Velocity of Single Push - Velocity @ Peak (78th Sample)											
Impulse Response	1	2	3	4	5	6	7	8	9	10	Total
1000	9.041	9.041	9.041	9.041	9.041	9.041	9.041	9.041	9.041	9.041	90.41
5000	45.21	45.21	45.21	45.21	45.21	45.21	45.21	45.21	45.21	45.21	452.1
10000	90.41	90.41	90.41	90.41	90.41	90.41	90.41	90.41	90.41	90.41	904.1
15000	135.6	135.6	135.6	135.6	135.6	135.6	135.6	135.6	135.6	135.6	1356
20000	180.8	180.8	180.8	180.8	180.8	180.8	180.8	180.8	180.8	180.8	1808
Mean	92.2122	92.2122	92.2122	92.2122	92.2122	92.2122	92.2122	92.2122	92.2122	92.2122	922.122
Std	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	68.66622666	686.6622666

3) Experimental Results: Provide at least one plot for your experiment, showing mean and standard deviation. Referring to this plot, explain how you optimized the parameter.

From the graph below, the variance from each run was nonexistent within the same change of impulse response. However, as the impulse response increased so did the velocity which can form the assumption that the higher impulse response the faster the agar.io and mouse will move. Referring to the graph I decided to go with a mid-range impulse response so that I can still enough time to change my direction without losing control as well as not exhaust my 'air pressure' making me lose gas before I moved enough.

