Guan, Huihua **Pole-Zero Interactive MATLAB GUI**

Documentation:
In this documentation, some aesthetic and naming issues are explained. Three examples are demonstrated below using my GUI.

In the zplane diagram, the old data for the pole conjugates shown up. This is why there are many X's on the plane. However, in calculations for impulse response and magnitude frequency response, only the most recent `handles` data is used - which are the bolded blue color X's.

The GUI is named `justsliders` but includes the pole zero diagram, impulse response, and magnitude frequency response with the adjustable sliders.

For impulse response:
As the pole position increase from (0 to 1), the starting impulse is higher and the decay time is slower as expected.

For frequency response:
As the pole position increase, the peak is sharper with a higher magnitude response as expected.

In Figure 1, the angle is fixed and the radius is set to 0.98.

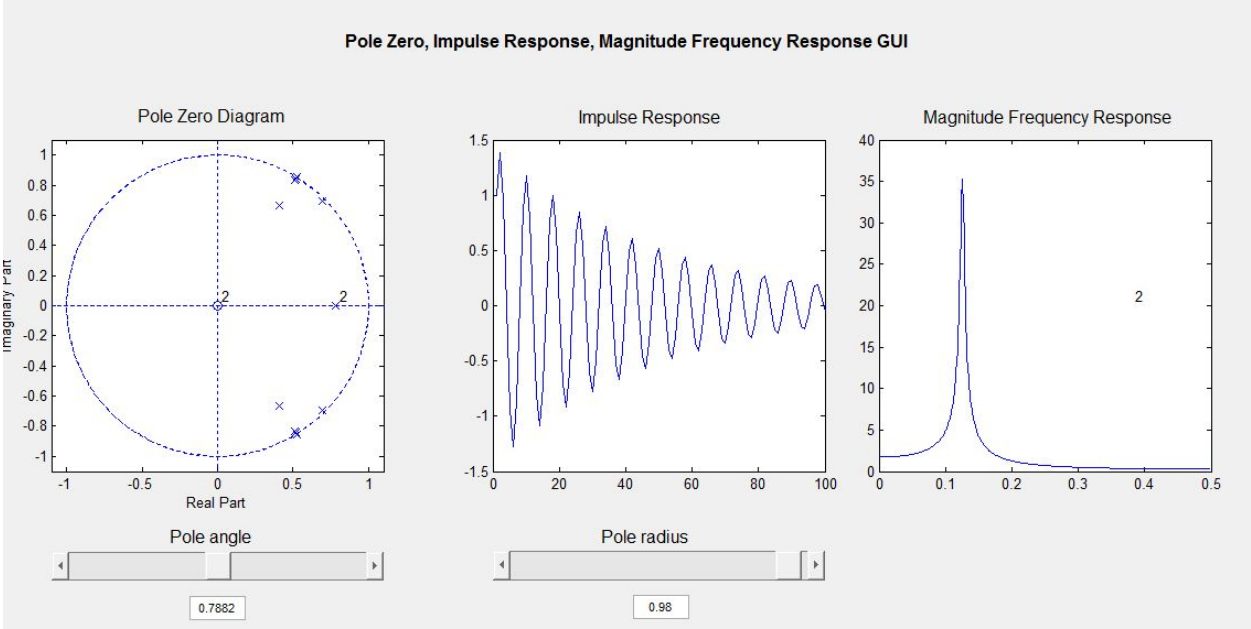

Figure 1

In Figure 2, the angle is fixed but the radius is set to a smaller value such as 0.50.

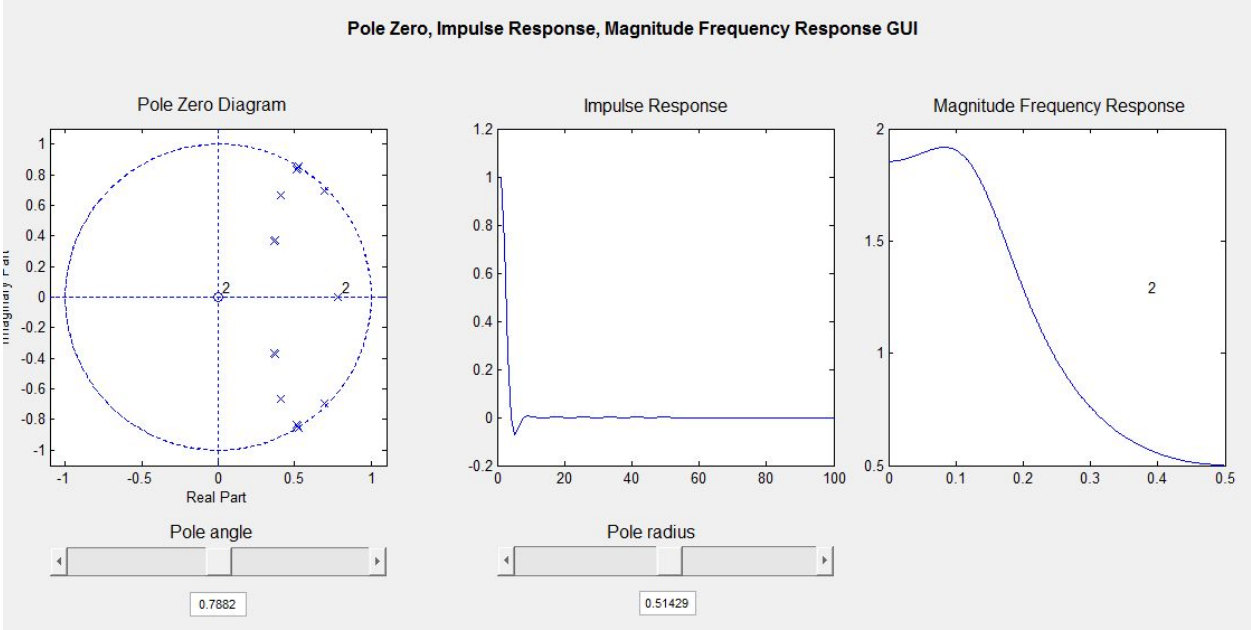

Figure 2

From this demonstration, it can be clearly concluded that at a fixed pole angle, as the pole radius increase, the decay rate will also decrease.

For impulse response:

As the pole angle increase from (0 to 0.5π), the number of impulses in each period will increase.

For frequency response:

As the pole angle increase, the distance between peaks increase while the magnitude of the response decrease.

In Figure 3, the pole radius is fixed to 0.94 and the pole angle is 0.17. It can be clearly concluded that the amount of impulses in a period is rather low. From here, it can be seen the positive peak of the magnitude frequency response is very close to the negative peak.

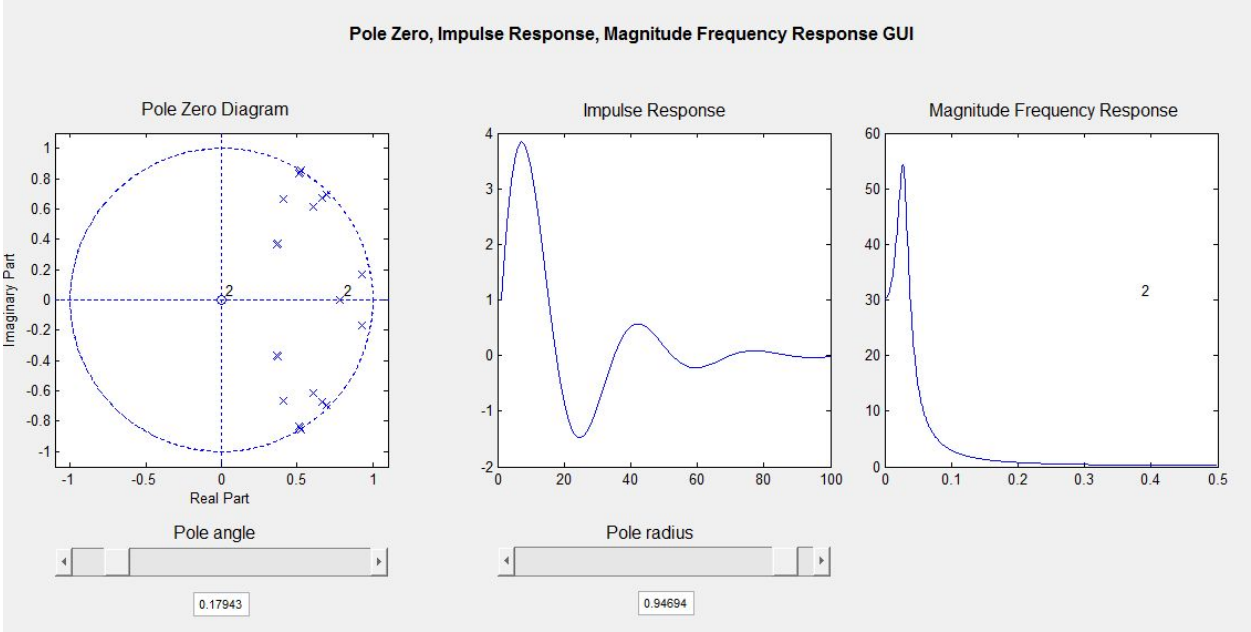

Figure 3

When the pole angle is increased to almost 0.5π, more impulse responses can be seen in each period compared to the image before. From Figure 4, it can be seen the distance between the positive peak of the magnitude frequency response and the negative peak is increased.

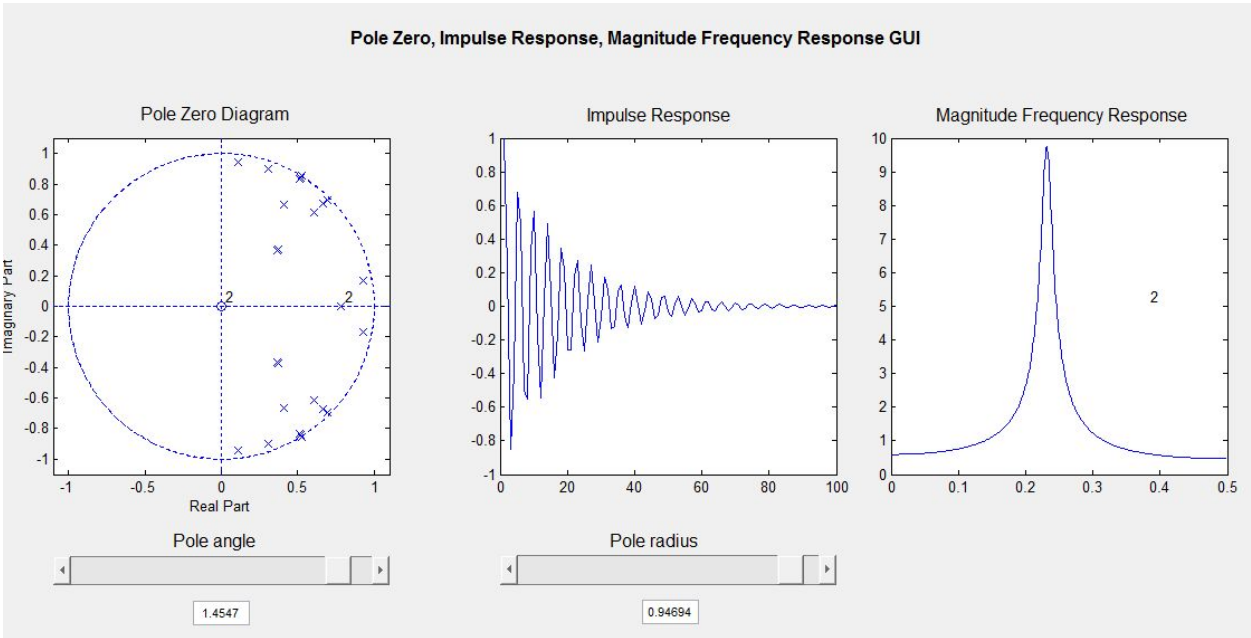

Figure 4

It is noted that there are two peaks in the magnitude frequency response, thus the number 2 appearing on the plot. In my design of GUI, I only show the positive peak.