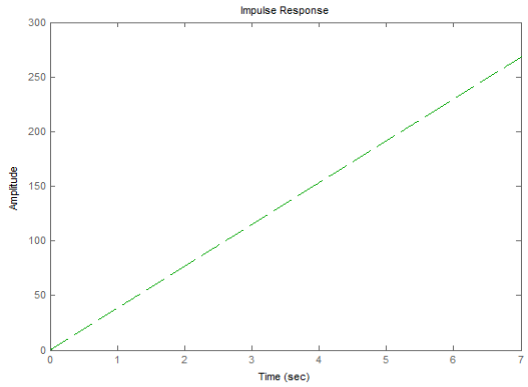

Figure 5. Impulse Response for the Open Form

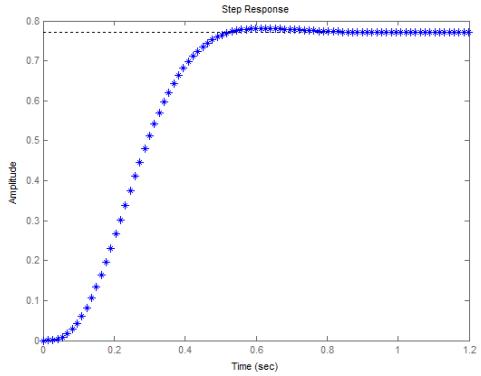

Figure 6. Step Response for the Closed Form

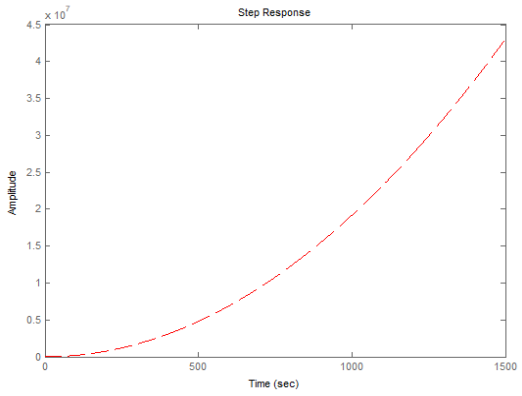

Figure 7. Step Response for the Open Form

Figure 4 impulse response for the closed form (the signal is highlighted in green) is better than the open form (the signal is highlighted in green in Figure 5. In the early stage the fluctuation of this signal is not stable and it fluctuates around the position at zero. The value of the amplitude of the closed form in this case is zero at the latter half of the operating cycle ($5*10^4$s) and the closed form reaches a steady state. For LQG regulator, the closed form responds well. The value of the amplitude of the open form in this case is large and the open form does not reach a steady state. The value of the green signal in Figure 10 did not reach a certain threshold during the operation of the system. Figure 6 step response for the closed form (the signal is highlighted in blue) is better than that for the open form (the signal is highlighted in red in Figure 7). In the first stage of this cycle, the oscillation value of this blue signal continuously increases. After that, it gradually stabilizes. The value of the amplitude of the closed form in this case is 0.8 and the closed form reaches a steady state. For LQG regulator, the closed form responds well. Meanwhile, the open form can not respond well. In general, for LQG regulator, the system responds well for the closed form. The value of the red signal in Figure 7 did not reach a certain threshold during the operation of the system.

Figure 4 and Figure 6: this results are satisfied with the requirements set because the final values of these results are determined by a specific number.

Part 2: Model with using Neural Networks Application for the data of LQG regulator

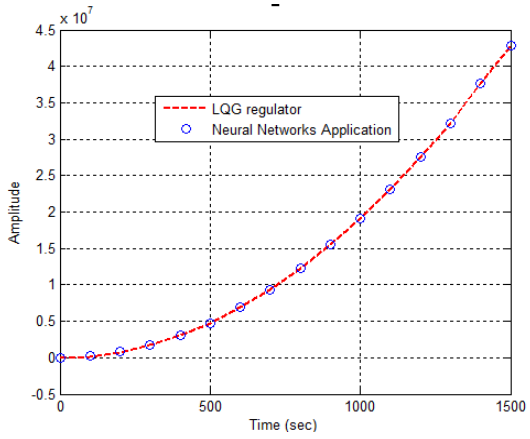

Figure 8. Step Response of the Open Form 'G(S)'

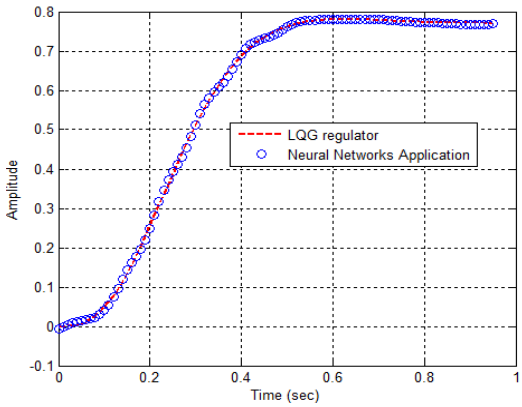

Figure 9. Step Response of the Closed Form 'G(S)'

Figures 8, 9 show that Neural Networks Application is the best choice for training the network according to a given control method. Results show that values of control methods

are relatively consistent with each other and results have achieved desired requirements.

After examining Figures 8 and 9, the signals denoted by the circle have 'followed' the signals denoted by the red dashed line. This shows that the neural network training is working well for all cases including the closed or open form of the design. The more the neural network's signals 'stick' to the target, the more satisfying the results achieved. In this case, they worked as planned

Limitations of this study: studies related to the topic are scarce so the author can refer to them. Recommendation: the author needs the cooperation of experts to have more rich content on this issue. The work of the future includes the development of artificial algorithms at a richer level of genre.

4. Conclusion

LQG regulator in case of noise signals affecting this system has been proposed by the author. Simulation results have been accepted for positive results. This allows the closed form to reach steady state in a long time. In fact, there are many noise signals affecting the system due to the working environment of the system. This can affect the output quality of a plan. In the future, LQG regulator can be implemented on complex systems to address advantages as the author described above. ANN + LQG is very useful in ensuring the security of the system from the approach owner of a system to the role of proxy. This method can be applied to flexible links in robotic arm systems, robotic biomedical systems in the future.

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