FL. 2018 ESE 447.02 Robotics Lab

Lab Journal 12

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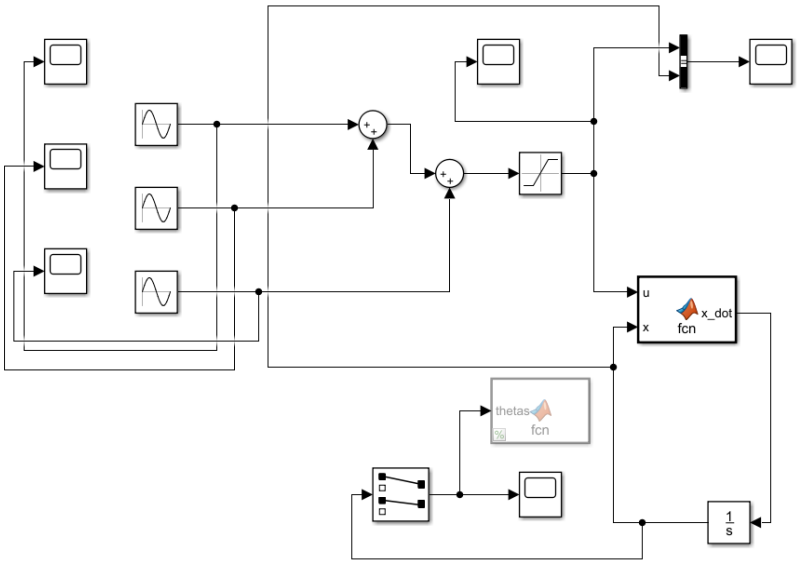
1. Finishing the Hamilton function
   The Hamiltonian function we created in previous lab was first tested with the simulated model we created before.



   As shown in the picture above, the model contains the main part of the model used to simulate the motion of the two-link robot system, and it includes the dynamics and plotting function. The difference is we added three sine-wave signal generators as the voltage input to create random motion for the links. A scope on the upper right corner was used to record the array of 4 state variables, voltage and time. The Hamiltonian function was then applied to the recorded data to calculate the thetas. When recording the data, we commented out the plotting function because the plotting would take a lot of computer memories and affect the efficiency of recording.
   Since we used 6 theoretical theta values in our simulation function, we were supposed to get the exactly same theta values using the Hamiltonian function. As a result, we did not get the exact values at the first, because the simulated motion of the links was not random enough. The randomicity of motion determines the quality of the data recorded because the more random the motion is, the more different moving situations you can get for the working envelope of the system. Therefore we improved the randomicity of the motion and eventually we got the exact theta values, thus proving the Hamiltonian function to be working.
2. After proving that the Hamiltonian function works, we are moving to the real system for next lab.