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| **Name** | **Date** | **Developed By** |
| Hanoi\_gui | 5 May 2014 | Diana Mar  Shreyasha Paudel |
| **Synopsis** | | |
| Applies sliding and parameter adaptive control to a robotic arm carrying out a sequence of moves for the Tower of Hanoi game. | | |
| **Description** | | |
| hanoi  The simulation generates the trajectory shown by determining the angles required to trace the trajectory shown within desired move time. The angles are then used in a feedback linearized arm system to generate the required torques for each joint. The torques follow the dynamics of the robot manipulator arm given by  where is the robot inertia matrix and the vector  contains the non-inertial torque contributions (centrifugal/coriolis, joint friction, gravity)  Control torque is generated by using sliding control or parameter adaptive control. The user can input estimated load mass, friction coefficients, move time and the settling time in the GUI which are used by the controller.  The GUI outputs final position for the end effector, applied torque and angular displacement of the joints. In addition, the GUI also provides information on the performance of the controller through integral square error in operational space, integral square of applied torque and the maximum deviation from the straight line trajectories. | | |
| **Supporting Files** | | |
| Hanoi\_GUI.fig  Hanoi\_GUI.m  Sliding\_control.slx, Parameter\_Adaptive\_control.slx  directhanoi.m, inversehanoi.m, straightline\_hanoi.m  feedback\_lin.m, hanoi\_torque.m, hanoidynamics.m, hanoitraj.m  Lyapunov\_P.m, pihatdot.m, Y.m | | |
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