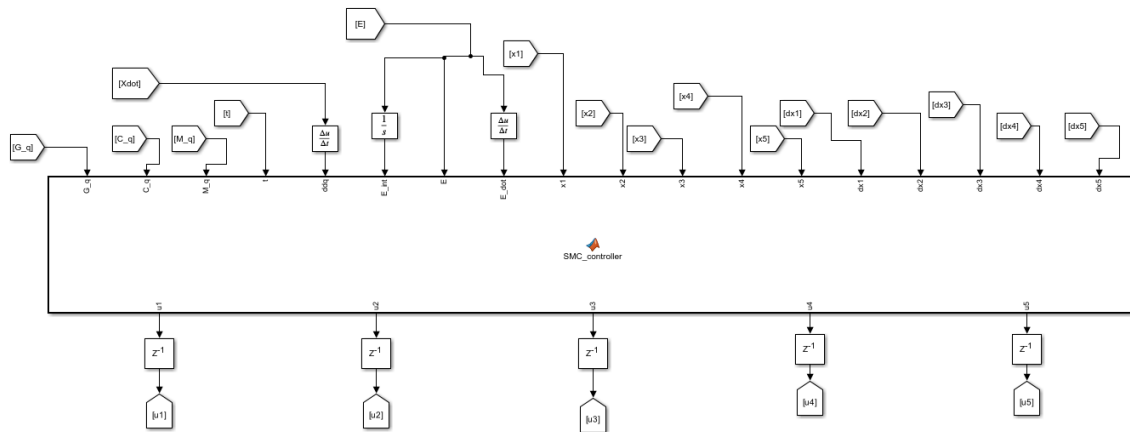In this block, the force disturbance has been produced and implement to the system. A force disturbance is generated and applied to the 5-DOF exoskeleton robot system, allowing for the evaluation of the system's dynamics and response to external perturbations.

In this block, a fuzzy estimator is employed to estimate the optimal values of the controller parameters. The fuzzy estimator uses fuzzy logic principles to approximate the optimal values of the controller parameters, which are crucial for achieving desired system performance.

In this block, the main controller block is introduced, which is responsible for generating the control signals that are applied to the system. The main controller block is the core component of the control system, and its primary function is to regulate the system's behavior and achieve the desired performance.

The main controller block takes the estimated optimal controller parameters from the fuzzy estimator, as well as the system's current state and error signals, as inputs. Using this information, the controller generates the control signals that are necessary to drive the system towards the desired behavior.
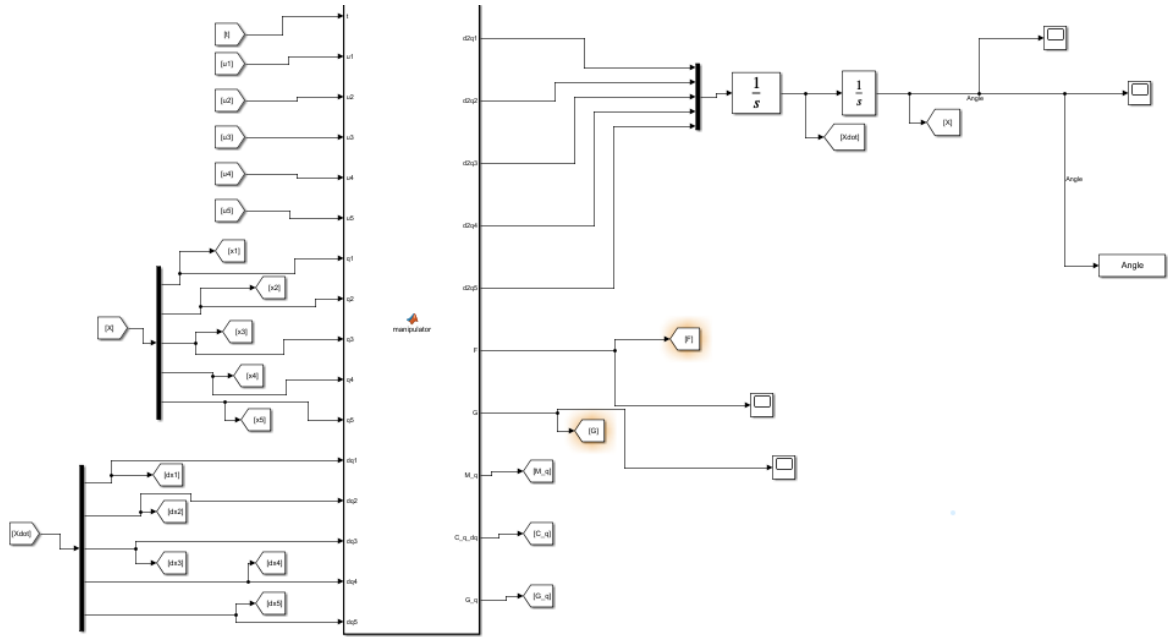
This block represents the physical implementation of the proposed 5-degree-of-freedom (DOF) robot system. The 5 DOF robot system is a complex mechanical system that consists of multiple joints and links, which are designed to work together to achieve a specific task or motion.

As discussed in the main manuscript, the control signals are the primary outputs of the control system, and it is crucial that they tend to zero as the system reaches its desired state. In other words, when the control signals tend to zero, it indicates that the control system has successfully achieved its objectives, and the system is operating in a stable and optimal manner.
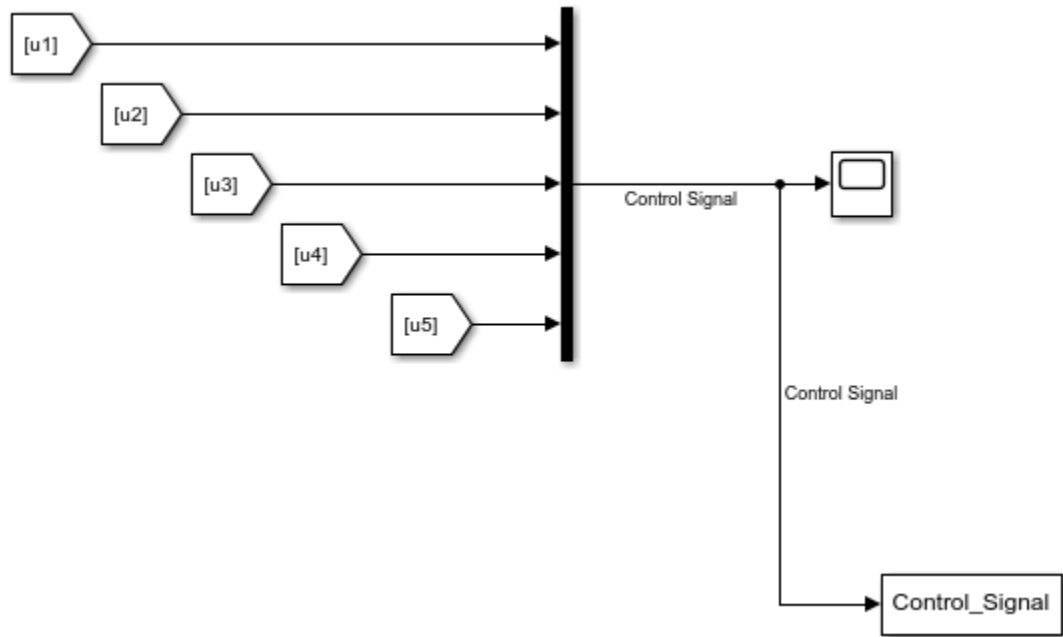
The results of the control system's performance have been plotted in the following diagram, which shows the control signals and system outputs over time. The diagram demonstrates that the control system has successfully achieved its objectives, and the results are in complete agreement with the outputs shown in the manuscript.