SYNOPSIS

Thesis Title : SIMULATION OF REAL TIME SUBSTRUCTURING TO EVALUATE DYNAMICS RESPONSE OF A STRUCTURE

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Real time sub structuring (RTS) is a hybrid technique meant for response evaluation of large structures. The critical component of the structures is experimentally evaluated, while the remaining structure is modelled analytically. The present work focuses on the simulation of RTS. Simulations helps to check to accuracy and the effectiveness of the algorithms developed towards implementing RTS. This thesis report discusses about delay compensation and numerical integration schemes associated with the simulation of RTS. A model based on Simulink module of MATLAB is proposed for simulation of RTS. The Actual experimental conditions are created by using the Simulink model of actuator. Feed-forward inverse transfer function is employed to compensate the actuator delay. Time integration is carried out to solve of a SDOF system, three story building and portal frame to El-Centro earthquake is evaluated by using the proposed model to demonstrate its effectiveness. The evaluated responses are compared with those obtained from Ode14x scheme available in Simulink. Upon comparison, the proposed technique is found to be effective for the evaluation of the linear dynamics response of a structure.