

Experimental and Simulation Characterization of the Suspension of a Small Car

W. Tiu

University Hertfordshire

Summary:

This paper will describe the work carried out to compare the experimental response of the car using a four actuator vibration rig and that obtained from an LS-dyna analysis using the same loading spectrum as that used in the physical experiment. The public domain frontal crash FE model was modified to reduce the solution time. Most of the materials used in the panels were changed to rigid as these were not expected to deform during a vibration analysis. The spring and damper rates in the FE model were modified in an iterative process until convergence was achieved. Road load data was then obtained by driving along a prescribed circuit with relevant instrumentation. The terrain of the circuit was then laser scanned to obtain a digital model. The digital terrain was then used in the simulation of the correlated car model going around the same circuit. The experimental/simulation responses were then compared against one another. The availability of the same physical and FE model has enabled our M.Sc. Engineering students to obtain a better understanding of suspension analysis and correlation process. Furthermore the exposure to both testing and simulation techniques will equip them better to face future challenges.