UCSI UNIVERSITY

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ENVIRONMENT

MODELING, SIMULATION AND
CONTROL OF A QUARTER CAR
SUSPENSION SYSTEM

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Abstract

The project entails comparingProportional Derivative Integral (PID) and LQR controllers on an active quarter car suspension model. A linear dynamic model is used in this study. It can capture basic performances of the vehicle suspension such as body displacement, body acceleration, wheel displacement, wheel deflection, and suspension travel. Performance of a suspension system is determined by the ride comfort and vehicle handling capabilities. Ride comfort can be measured by observing the car body. Other parameters that will be observed are suspension travel and wheel deflection. A model of the road disturbances will be used in this study.Simulation is based on a mathematical model derived from equations of motion from the free body diagram of the quarter car system using MA TLAB/SIMULINK software. Results show that performance of body displacement and wheel displacement can be improved by using LQR and PID control scheme.