

Retrofitted Semi-Active Suspension System for a Electric Model Vehicle

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Abstract : A 40 steps manual adjusting shock absorber was refitted with DC motor driving mechanism to construct as a semi-active suspension system for a four-wheel drive electric vehicle. Accelerometer and potentiometer sensors are installed to measure the sprung mass acceleration and suspension system compression or rebound states for control purpose. A fuzzy logic controller was designed to derive appropriate damping target based on vehicle running condition for semi-active suspension system to follow. The damping ratio control of each wheel axis suspension system is executed with a robust fuzzy sliding mode controller (FSMC). Different road surface conditions are chosen to evaluate the control performance of this semi-active suspension system based on wheel axis acceleration signal.

Keywords : semi-active suspension, electric vehicle, fuzzy sliding mode control, accelerometer

Conference Title : ICCA 2014 : International Conference on Control and Automation

Conference Location : Kyoto, Japan

Conference Dates : November 13-14, 2014