

عنوان مقاله:

Stability Enhancement of In-Wheel Motor Drive Electric Vehicle Using Adaptive Sliding Mode Control

محل انتشار:

مجله بین المللی طراحی پیشرفته و تکنولوژی ساخت, دوره 15, شماره 2 (سال: 1401)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

A multi-layer controller of direct yaw moment for electric vehicles is developed in this study. In the upper layer, the yaw moment are obtained using Adaptive Sliding Mode Control (ASMC) with adaptation gain to track the desired vehicle yaw rate. The corrective yaw moments are applied by four in-wheel electric motors. The lower layer controller consists of a torque distribution algorithm and in-wheel motor torque controllers as well. The proposed torque distribution algorithm is intended to distribute the reference torques of each in-wheel motor controller appropriately based on both total longitudinal force and corrective yaw moment. To elucidate the effectiveness and robustness of the above control method, the simulation under various manoeuvres was carried out. A Y-DOF non-linear vehicle model is used for simulations and their results signify that the proposed control algorithm accomplishes a proper distribution of longitudinal force among four individual wheels, in turn, enhancing the yaw stability of the vehicle.

کلمات کلیدی:

Adaptive Sliding Mode Control, Direct Yaw Moment, Stability Enhancement, Torque Distribution

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