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عنوان مقاله:

Optimal control with adaptive weighting coefficients for integrated vehicle dynamics control

محل انتشار:

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Abstract: In this work, an optimal control scheme with adaptive weighting coefficients is presented which coordinates different vehicle dynamics control objectives, thus ruling out possible conflicts among them. In a new approach, the weighting coefficients in optimal control are adjusted according to the vehicle state in the phase plane in such a way that a priority is given to each objective of handling and stability in each region. The optimal control acts as a high-level control for the vehicle body, which determines the body lateral force and yaw moment for stable vehicle motion. The body lateral force and yaw moment provide the inputs to the mid-level force (control) distribution module, which works out the desired lateral and longitudinal forces at each wheel. Therefore, the high-level control objectives are allocated to individual tire forces in an optimal manner with the assumption of a ۴-wheel-independent car. A low-level control uses the desired individual tire forces to compute the steering angle and applied torque at each wheel. Simulation tests with a nonlinear vehicle model are conducted and comparison with the well-recognized work in the literature is made to show the efficiency of the proposed method.

کلمات کلیدی:

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