عنوان مقاله:
Effect of Drivers Time Delay on the Stability of Vehicle

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خلاصه مقاله:
This paper addresses the deterioration in the handling properties of vehicle posed due to the declined driver's ability. More emphasis is given to the effects of driver's time delay on the dynamic behaviour of vehicle. Taking into account driver time delay in the modelling, transforms the ehicle handling dynamics to a system of delay differential equations (DDE), which has infinite solution in mathematical sense. To solve the follow-on DDE, the time delay is approximated via Pade approximation. Stability charts, demonstrating the acceptable regions for driver's proportional and derivative gains are provided for a specified driver time delay. The critical value of driver time delay for a particular set of drivers proportional and derivative gains is also calculated. Numerical simulation of a vehicle driver model subjected to a rigorous lane change manoeuvre is carried out to verify the results obtained from the stability charts. In the simulation a nonlinear seven degree of freedom of vehicle and a nonlinear tire model is used.

کلمات کلیدی:
Pade Approximation, Routh-Hurwitz, Driver