

INVESTIGATION OF THE DRIVER - VEHICLE DYNAMICS

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ABSTRACT: This paper reviews the current problems in the development of vehicle design and its optimal adaptation to drivers in terms of safety driving. Summarizes the characteristic mathematical model to describe the driver control. On suitable models discussed the dynamics and own vehicle instability in an open loop. As well as the interaction of vehicle dynamics and parameters of sight field of the driver are considered. Control system driver-vehicle-environment is modeled. It is designed optimal LQG regulator in parallel and in series-parallel contours with contour effects drivers. The results of research indicate instability of the vehicle in open loop, the effects of the stabilization system achieved by driver. In addition, the application of the optimal controller in this study served as the basis of forming criteria for evaluating vehicle dynamics with respect to driver control.

KEY WORDS: vehicle, driver, model, Kalman, estimator

ISTRAŽIVANJE DINAMIKE VOZAČ-VOZILO

REZIME: Ovaj rad razmatra aktuelne probleme u razvoju dizajna vozila i njegovo optimalno prilagođavanje vozaču u pogledu sigurnosti vožnje. Sumira karakterističan matematički model kako bi opisao kontrolu vozača. Na pogodnim modelima diskutovana je dinamika i nestabilnost vozila u otvorenoj petlji. Uzete su u obzir i interakcija dinamike vozila i parametara vidnog polja vozača. Sistem kontrole vozač-vozilo-okruženje je modelirano. Dizajniran je optimalan LQG regulator u paralelnim i serijsko-paralelnim konturama sa konturom efekta vozača. Rezultati istraživanja ukazuju na nestabilnost vozila u otvorenoj petlji, i efekte sistema stabilizacije koji se postižu od strane vozača. Onda se efekat optimalnog kontrolera kada je u pitanju poboljšanje ponašanja celokupnog sistema. Pored toga, primena optimalnog kontrolera u ovoj studiji poslužila je kao osnova za formiranje kriterijuma vrednovanja dinamike vozila u pogledu kontrole vozača.

KLJUČNE REČI: vozilo, vozač, model, Kalman, procenitelj

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