

Innovative Inverse Control Techniques For Adaptive Tracking Of Nonlinear Dynamic Plants

Khan, T. Shafiq, M.;Dept. of Syst. Eng., King Fahd Univ. of Pet. & Miner., Dhahran;
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King Fahd University of Petroleum & Minerals

<http://www.kfupm.edu.sa>

Summary

Adaptive tracking of nonlinear dynamic plants is an active area of research. The main difficulty felt in establishing the tracking of nonlinear dynamic plants is the computational complexity in controller design. This paper presents novel adaptive tracking techniques for a class of nonlinear dynamic plants based on a control oriented model known as U-model. The use of U-model reduces the computational complexity of the controller design that occurs when using other modelling frameworks such as NARMAX (nonlinear autoregressive moving average with exogenous inputs) model. Four different adaptive control techniques based on U-model are discussed namely adaptive inverse control (AIC), adaptive internal model control (AIMC), AIC with pole-placement and AIMC with pole-placement. The proposed techniques are implemented in real-time on a laboratory scale experimental setup for speed control of DC-motor. The results of the experiments are provided

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