

Optimization of E-motor Control Parameters for Electrically Propelled Vehicles by Integral Squared Method

Authors : Ibrahim Cicek, Melike Nikbay

Abstract : Electrically propelled vehicles, either road or aerial vehicles are studied on contemporarily for their robust maneuvers and cost-efficient transport operations. The main power generating systems of such vehicles electrified by selecting proper components and assembled as e-powertrain. Generally, e-powertrain components selected considering the target performance requirements. Since the main component of propulsion is the drive unit, e-motor control system is subjected to achieve the performance targets. In this paper, the optimization of e-motor control parameters studied by Integral Squared Method (ISE). The overall aim is to minimize power consumption of such vehicles depending on mission profile and maintaining smooth maneuvers for passenger comfort. The sought-after values of control parameters are computed using the Optimal Control Theory. The system is modeled as a closed-loop linear control system with calibratable parameters.

Keywords : optimization, e-powertrain, optimal control, electric vehicles

Conference Title : ICMIMEA 2020 : International Conference on Mechanical, Industrial and Mechatronics Engineering Applications

Conference Location : Dublin, Ireland

Conference Dates : November 05-06, 2020