

Embedded Intelligent Car Navigation and Voice Control System Design

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Abstract

This research was to make an embedded intelligent car navigation and voice control system, which was obtained by using an embedded Digital-Signal-Processor (DSP) TMS320C6711 and Kalman Filter technology to integrate Inertia Navigation System (INS), Global Positioning System (GPS), and Geographic Information System (GIS), Global Satellites for Mobile Communication System (GSM) as well as a voice module. The performances of the navigation system of INS aided with GPS by using Kalman filter integration method were studied. The embedded intelligent system can preserve the advantages and avoid the disadvantages of both systems. The lost tracking conditions of GPS were also performed, the results showed that the longer the GPS locked, the better the errors of INS were calibrated. Thus the navigation system of INS aided with GPS was better than that with only GPS or INS. In addition, we also developed a voice-recognition module and two DC motors to drive vehicle shafts for direction and movement control, such that the car can be controlled by the proposed embedded intelligent system with voice command.

Keyword : embedded intelligent control system, INS, GPS, DSP