Abstract

Parking cars is quite a challenge in congested parking bays and for inexperienced drivers. Automatic parking assistance systems (APAS) are limited to high-end cars in India. This paper discusses the design of APAS for Hyundai Santro and development of an automatic parking assistant system for a scaled down prototype model using a stepper motor mounted ultrasonic sensor to scan the obstacles. 3-point unequal rotating radius algorithm is used to identify parking path shifting points and parking trajectory. Path shifting control algorithm based on timing and distance traversed is developed using MPLAB IDE. A prototype is developed on a scaled down model of a vehicle and performance of the APAS system is verified. Accuracy of
the system is ±10% which is acceptable for low cost solution developed. Repeatability of APAS is tested, which is ±15%. This can be improved with closed loop control in parking process. Cost of the developed system is reduced by more than 50% of the commercially available APAS systems. From the results, APAS system can be used in any small segment cars with little changes in logic. Path traversed can be used as feedback to further improve the accuracy of APAS system.

References


Index Terms

Computer Science

Artificial Intelligence
Keywords
Parking Assistance  Automatic  Intelligent  Ecu  Three-point Unequal Rotating Radius