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Parking Space Detection and Trajectory Tracking Control for Vehicle Auto-Parking

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Abstract : On-board available parking space detecting system, parking trajectory planning and tracking control mechanism are the key components of vehicle backward auto-parking system. Firstly, pair of ultrasonic sensors is installed on each side of vehicle body surface to detect the relative distance between ego-car and surrounding obstacle. The dimension of a found empty space can be calculated based on vehicle speed and the time history of ultrasonic sensor detecting information. This result can be used for constructing the 2D vehicle environmental map and available parking type judgment. Finally, the auto-parking controller executes the on-line optimal parking trajectory planning based on this 2D environmental map, and monitors the real-time vehicle parking trajectory tracking control. This low cost auto-parking system was tested on a model car.

Keywords : vehicle auto-parking, parking space detection, parking path tracking control, intelligent fuzzy controller
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