

Title: Advancements in Radar Technology for Enhanced Adaptive Cruise Control Systems(Conference Paper)

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Abstract

In an interconnected world, radar technology plays a crucial role in enhancing vehicle safety through Adaptive Cruise Control (ACC), a system designed to maintain optimal speed and spacing between vehicles. This paper explores the integration of Frequency Modulated Continuous Wave (FMCW) radar with Constant False Alarm Rate (CFAR) clutter rejection to improve detection reliability in adverse weather conditions, specifically rain. The study involves a detailed simulation of an ACC scenario with multiple targets up to 200 meters away and moving targets as slow as 0.0083 meters per second, focusing on the impact of rain clutter on radar performance. The results demonstrate that incorporating CFAR significantly mitigates the effects of clutter, ensuring precise range and velocity measurements even in challenging environments. The findings underscore the potential of advanced radar technologies to enhance the robustness and safety of ACC systems, paving the way for more reliable autonomous driving solutions. © 2024 IEEE.

Author keywords

Adaptive Cruise ControlCFARClutter RejectionCluttersDriving SafetyFMCW Radar

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