

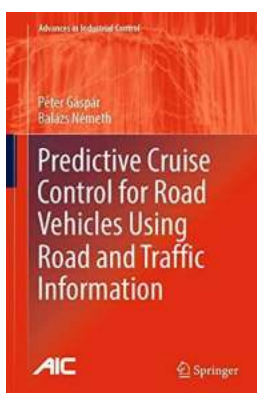
Predictive Cruise Control For Road Vehicles Using Road And Traffic Information

Do you ever wish your car could drive itself? Well, thanks to recent advancements in technology, the future may not be too far away. Predictive cruise control systems are revolutionizing road vehicle experiences by using road and traffic information to enhance the driving experience. In this article, we will explore the world of predictive cruise control and how it is transforming the automotive industry.

What is Predictive Cruise Control?

Predictive cruise control, also known as intelligent adaptive cruise control, is a technology that uses various sensors and systems to control a vehicle's speed and distance from other vehicles, all while accounting for road and traffic conditions. Traditional cruise control systems allow drivers to set a desired speed, but they do not take into account the surrounding environment.

Predictive cruise control, on the other hand, considers a wide range of factors such as traffic flow, speed limits, road conditions, and even topographical data. By leveraging this information, the system can make intelligent decisions to optimize fuel efficiency, reduce traffic congestion, and enhance overall safety.



Predictive Cruise Control for Road Vehicles Using Road and Traffic Information (Advances in Industrial Control)

by Michael Riegel (1st ed. 2019 Edition, Kindle Edition)

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File size : 49742 KB

Text-to-Speech : Enabled

Screen Reader : Supported
Enhanced typesetting : Enabled
Word Wise : Enabled
Print length : 380 pages



How Does Predictive Cruise Control Work?

The predictive cruise control system relies on a combination of sensors, cameras, radar, and GPS technology to collect and analyze data about the vehicle's surroundings. The sensors detect and track nearby vehicles, while the cameras capture road signs, traffic lights, and other environmental elements. Radar systems provide additional information about the distance and relative speed of other vehicles in the vicinity, and GPS technology helps keep track of the vehicle's position.

Once the system has collected the necessary data, it uses complex algorithms and artificial intelligence to make predictions and optimize the vehicle's speed. For example, if the system detects heavy traffic up ahead, it may automatically reduce the vehicle's speed to ensure a safe and smooth driving experience.

Benefits of Predictive Cruise Control

Predictive cruise control systems offer a wide array of benefits to both drivers and society as a whole. Here are some key advantages:

1. Fuel Efficiency:

By optimizing speed based on road and traffic conditions, predictive cruise control systems can significantly improve fuel efficiency. They ensure that the vehicle

operates at the most economical speed, thereby reducing fuel consumption and emissions.

2. Traffic Congestion Reduction:

Predictive cruise control systems contribute to reducing traffic congestion by maintaining a consistent flow of traffic. The system can automatically adjust the vehicle's speed to match the traffic ahead, preventing unnecessary acceleration or braking that can lead to congestion.

3. Enhanced Safety:

The integration of road and traffic information allows predictive cruise control systems to enhance overall safety. By adjusting the vehicle's speed and maintaining a safe distance from other vehicles, these systems can help prevent accidents caused by human error.

4. Improved Comfort and Convenience:

Predictive cruise control systems relieve drivers of the constant need to monitor speed, traffic, and road conditions. This can significantly reduce driver fatigue and increase comfort during long journeys.

Future Implications

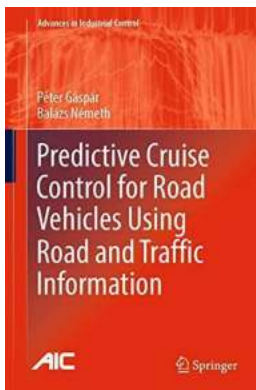
Predictive cruise control is just the tip of the iceberg when it comes to autonomous driving technology. As more vehicles adopt this technology, we can expect to see even more intelligent and sophisticated systems in the future.

In addition to using road and traffic information, future iterations of predictive cruise control may incorporate real-time data from other vehicles. This vehicle-to-vehicle communication could enable vehicles to share information about road conditions, hazards, and traffic patterns, further optimizing the driving experience.

Furthermore, as autonomous driving technology evolves, there is the potential for fully autonomous vehicles that eliminate the need for human intervention altogether. The combination of predictive cruise control and other autonomous driving features could revolutionize transportation as we know it.

Predictive cruise control systems are paving the way for a future where road vehicles can navigate the roads more efficiently and safely. By utilizing road and traffic information, these systems optimize fuel efficiency, reduce traffic congestion, and enhance overall safety. As technology continues to advance, we can expect to see even more sophisticated iterations of predictive cruise control, bringing us closer to fully autonomous driving.

We are on the cusp of a transportation revolution. Are you ready?



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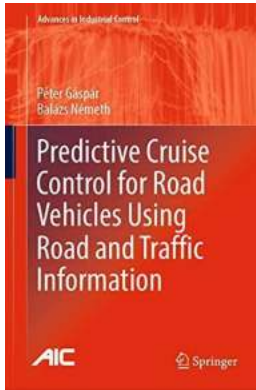


This book focuses on the design of a multi-criteria automated vehicle longitudinal control system as an enhancement of the adaptive cruise control system. It

analyses the effects of various parameters on the average traffic speed and the traction force of the vehicles in mixed traffic from a macroscopic point of view, and also demonstrates why research and development in speed control and predictive cruise control is important. The book also summarises the main steps of the system's robust control design, from the modelling to its synthesis, and discusses both the theoretical background and the practical computation method of the control invariant sets.

The book presents the analysis and verification of the system both in a simulation environment and under real-world conditions. By including the systematic design of the predictive cruise control using road and traffic information, it shows how optimization criteria can lead to multiobjective solutions, and the advanced optimization and control design methods required. The book focuses on a particular method by which the unfavourable effect of the traffic flow consideration can be reduced. It also includes simulation examples in which the speed design is performed, while the analysis is carried out in simulation and visualization environments.

This book is a valuable reference for researchers and control engineers working on traffic control, vehicle control and control theory. It is also of interest to students and academics as it provides an overview of the strong interaction between the traffic flow and an individual vehicle cruising from both a microscopic and a macroscopic point of view.



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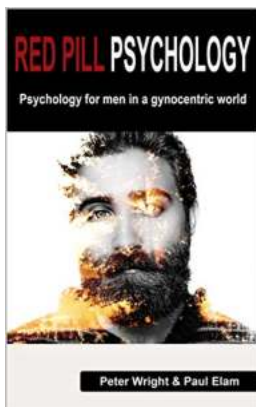
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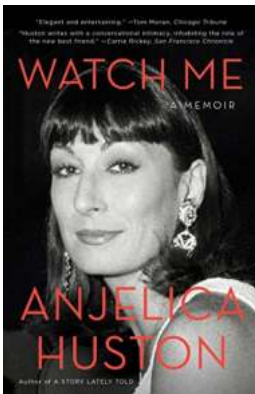
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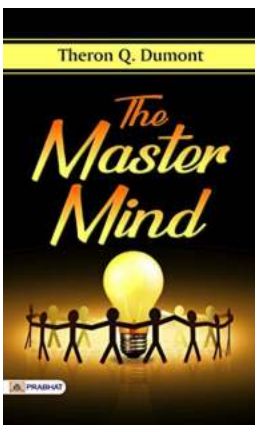
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