

Article	Research Question	Methods	Key Findings	Strengths/ Weaknesses	Relevance to My Research
Real-Time Lane Detection for Autonomous Vehicles (2017) Authors: K. R. Pandey, et al.	How can real-time lane detection be achieved for self-driving cars?	Computer vision, lane detection algorithms	Lane detection is crucial for autonomous driving systems.	Strengths: Real-time performance. Weaknesses: Environmental variability.	Relevant for lane-keeping algorithms in autonomous vehicles.
Deep Reinforcement Learning for Autonomous Vehicle Navigation: A Survey (2017) Authors: S. W. Lee, et al.	How can deep reinforcement learning improve vehicle navigation?	Survey of deep reinforcement learning methods	DRL enhances decision-making in dynamic environments.	Strengths: Practical application in dynamic settings. Weaknesses: Complex to implement.	Useful for developing real-time decision-making systems in my research.
Human-Machine Interaction in Autonomous Vehicles: A Survey on User Experience and Interface Design (2015) Authors: J. L. Rocha, et al.	How does human-machine interaction affect autonomous vehicle operation?	Survey of user experience studies, human factors analysis	Human-machine interfaces play a significant role in vehicle acceptance.	Strengths: Focus on human factors. Weaknesses: Limited technical analysis.	Important for designing user-friendly interfaces for autonomous vehicles.
The Role of 5G Connectivity in Autonomous Vehicle Safety (2019) Authors: D. I. Kim, et al.	What role does 5G connectivity play in the safety of autonomous vehicles?	Theoretical analysis, review of 5G technology and vehicular networks	5G connectivity improves vehicle-to-vehicle communication and safety.	Strengths: Focus on connectivity. Weaknesses: Limited real-world examples.	Useful for considering network communication in autonomous vehicle systems.

Sensor Fusion for Autonomous Vehicles: A Survey of Recent Approaches (2018) Authors: A. H. Shoukry, et al.	What are the recent advancements in sensor fusion for autonomous vehicles?	Review of sensor fusion techniques and algorithms	Fusion of multiple sensors improves perception and decision-making.	Strengths: Comprehensive survey. Weaknesses: No discussion of sensor limitations.	Direct relevance to my research on sensor data integration.
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Worksheet 2: Synthesising Literature

- **Activity:** Group similar articles by themes and fill in the table below.

Theme	Key Studies	Findings	Gaps Identified
Lane detection and computer vision algorithms in autonomous driving.	Focuses on real-time lane detection techniques for autonomous vehicles using computer vision, including edge detection and deep learning models.	Real-time lane detection significantly improves driving safety and is critical for autonomous vehicles' lane-keeping functionality. The proposed methods showed promising accuracy and speed.	Limited ability to handle complex road conditions, such as merging lanes, construction zones, and variable lighting conditions.
Application of deep reinforcement learning (DRL) to autonomous vehicle navigation and decision-making.	Discusses various DRL techniques and their application in navigation, including Q-learning and policy-gradient methods.	DRL has been successfully applied to enhance autonomous vehicle navigation, particularly for decision-making in complex, dynamic environments. It improves real-time adaptation and learning from the vehicle's interactions with the environment.	While DRL shows promise, its implementation requires substantial computational resources and extensive training data. Challenges in handling edge cases and ensuring safe exploration remain.
Human-machine interaction (HMI) and user	Focuses on how HMI and interface design influence the acceptance and safety	Effective HMI design is critical for ensuring trust and safety in autonomous vehicles. Clear communication and appropriate feedback	Limited research on how HMI design impacts user behaviour in emergency or unexpected situations,

experience in autonomous vehicles.	of autonomous vehicles. Discusses feedback systems, user control, and the importance of clear communication between the vehicle and the user.	systems can help users feel comfortable and in control, even in fully autonomous modes.	and a lack of standardization in interface design across different autonomous systems.
The importance of 5G connectivity in enhancing the safety and communication of autonomous vehicles.	Examines the potential of 5G networks to improve vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication for safer and more reliable autonomous driving.	5G connectivity can significantly enhance the communication capabilities of autonomous vehicles, leading to faster, real-time updates on traffic conditions, vehicle status, and infrastructure changes.	Current 5G infrastructure is not yet widely available, and there are challenges in ensuring seamless communication in remote or rural areas. The paper also highlights the lack of integration with existing infrastructure in some regions.
Sensor fusion techniques and how they enhance autonomous vehicle perception.	Provides a review of sensor fusion approaches that combine data from LIDAR, radar, cameras, and other sensors to improve environmental perception and decision-making.	Sensor fusion enhances the accuracy and reliability of perception systems in autonomous vehicles by reducing blind spots and errors caused by individual sensor limitations. Combined sensor data improves object detection, tracking, and obstacle avoidance.	The complexity of real-time sensor fusion algorithms can lead to high computational demands. Additionally, challenges remain in achieving robust sensor fusion in challenging weather conditions, such as fog or heavy rain.