

# Robust Deep Reinforcement Learning in Autonomous Car Path Planning

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**Abstract:** *The rapid advancements in autonomous vehicle technology have emphasized the need for adaptable and dependable control systems. Deep Reinforcement Learning (DRL) has emerged as a key method to address the complexity involved in autonomous driving. This research explores how DRL can enhance path planning and control mechanisms in self-driving vehicles, with a particular focus on its ability to handle dynamic traffic environments. The challenges in training DRL models, including generalization, safety, and real-time decision-making, are analyzed. The paper also suggests potential research directions for improving DRL's application in autonomous driving, offering insights into its strengths and limitations in the current technological landscape.*

**Keywords:** Autonomous Vehicles, Deep Reinforcement Learning (DRL), Path Planning, Vehicle Control