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# Harnessing blockchain for resilient emergency message dissemination in vehicular ad hoc networks

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## Abstract

Vehicles exchanging information in real-time to enhance road safety and optimise traffic flow is a burgeoning field of study in Vehicular Ad hoc Networks (VANETs). Efficient transmission of emergency warning messages in VANETs is crucial to mitigate collision risks, minimise delays and reduce message redundancy. In this study, we analyse existing protocols and propose the 'Rate Decreasing Algorithm' to address these challenges. The algorithm adaptively adjusts the transmission rate of emergency warning messages based on vehicle conditions, striking a balance between the risk of flooding the network and premature loss of messages. We integrate blockchain technology into the algorithm to enhance security and accountability, providing vehicle registration, message source verification, integrity maintenance and transaction log capabilities. Our experimental results demonstrate that the proposed algorithm significantly reduces collisions and delays compared to existing protocols, even in scenarios with varying vehicular densities. Blockchain-based mechanisms enhance the algorithm's performance, ensuring trust, integrity and accountability in Vehicle-to-Vehicle (V2V) communication. This study highlights the potential of the proposed algorithm and blockchain integration in improving the efficiency and security of V2V communication in VANETs, contributing to safer and more reliable transportation systems.

## Keywords

VANET, blockchain, RD algorithm, smart contracts

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