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# Traffic Management for Emergency Vehicles Based on Visual Sensing and AI

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**Abstract:** *The timely arrival of emergency vehicles at their destinations is crucial for ensuring public safety and health. However, traffic congestion and inefficient traffic signal control can significantly delay emergency response times, leading to increased morbidity and mortality. To address this challenge, we propose a novel traffic management system that leverages visual sensing and artificial intelligence (AI) to prioritize emergency vehicles and minimize delays. Our system utilizes computer vision and machine learning algorithms to detect emergency vehicles in real-time and optimize traffic signal control to ensure their rapid passage. We evaluate the performance of our system through simulations and real-world experiments, demonstrating its ability to reduce emergency response times by up to 30% while minimizing disruptions to regular traffic flow. Our approach has significant potential to improve public safety and health outcomes, and its implementation could be a valuable addition to smart city initiatives. The proposed system's real-time optimization capability, scalability, and adaptability make it an attractive solution for traffic management in urban areas.*

**Keywords:** Visual sensing, Traffic management for emergency vehicles,Artificial Intelligence (AI), Machine Learning (ML),Computer Vision, Intelligent transportation, Real Time processing