Leahla Chism[1], Bryce Campbell[2] Oral Roberts University

Engineering Real-Time Analytical Vehicular Emergency Response for Personnel Efficacy Using AI

ABSTRACT

Police-reported motor vehicular accidents (MVA) in the United States occurred nearly 6 billion times in 2022, according to the National Highway Traffic Safety Administration. This includes nearly 109 deaths and over 16,000 injuries reported from MVAs, daily.

Currently, emergency responders rely on 9-1-1 calls made by the accidented person, bystanders, or onlookers. These calls are routed to emergency centers via nearby cell towers, providing dispatchers with data such as location and caller identity. The dispatcher then assigns the appropriate emergency services to the scene.

In some extreme scenarios, an individual(s) might be involved in an MVA without detection of human life or observed too late. Information regarding safety depends on data received and the data observed by the communicator. Faulty, misleading, or nescience regarding communication may hinder the efficiency of receiving proper care from emergency responders.

In this research, I will present a method that indicates damage potential in a vehicle using engineering concepts such as sensors, cameras, and structure analysis along with artificial intelligence (AI) algorithms to develop real-time emergency responses of auto-detected data.

The methods that will be used will be a strictly quantitative design using statistical analysis of experimental vehicular damage points, fusion sensor analysis, finite element analysis, machine learning algorithms to detect damage, and V2X communication networks.

The results indicate that communication between motor vehicles and sensors provides a reliable emergency response system using engineered structure analysis and sensor fusion data. This will lead to an increase in MVA response time and MVA emergency response performance. A decrease in MVA injury rate and MVA fatality rate is to be plausible for increase in response time and performance.

In conclusion and in relevancy, engineering an optimized emergency response for emergency personnel in the events of an MVA helps satisfy public safety and public health concerns in response time, emergency preparedness, proactive measures, and data efficiency. To do so, research on how to better optimize these concerns is required in engineering prospectives, using AI and learning algorithms.