ABSTRACT

The Wake-Watch project proposes an innovative system aimed at enhancing automotive safety by integrating drowsiness detection and SOS functionalities. This system leverages advanced machine learning algorithms to analyze driver behavior, including eye movements, facial expressions, and steering patterns, in real-time to accurately detect signs of drowsiness. Upon detecting these signs, Wake-Watch promptly triggers auditory and visual alerts to urge the driver to take necessary precautions or initiate a break. Additionally, in critical situations such as accidents or health emergencies, the system automatically sends out distress signals to emergency services and predefined contacts, providing crucial assistance and reducing response time. By combining drowsiness detection with SOS capabilities, the Wake-Watch project offers a comprehensive solution to mitigate the risks associated with driver fatigue, thereby contributing to safer roads and preventing potential accidents. Moreover, the framework of the Wake-Watch system can be extended to incorporate additional security features, such as restricting vehicle access to authorized individuals and preventing engine start in case of theft attempts. The model's accuracy can be incrementally improved by incorporating other parameters like blink rate, yawning, and vehicle state. Future enhancements include integrating heart rate monitoring to prevent accidents caused by sudden driver health issues. The underlying technology also has potential applications beyond automotive safety, such as detecting when users fall asleep while watching streaming services like Netflix and automatically pausing the content, or in applications designed to prevent users from falling asleep. This project demonstrates a commitment to leveraging technology to create safer and more responsive systems across various domains.

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