

POPULAR SCIENTIFIC ABSTRACT

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Unobtrusive In-Car Vital Signs Monitoring

Imagine a car that can monitor your health while you drive, ensuring you stay safe and sound on the road. This PhD thesis explores the exciting world of in-car health monitoring systems that operate without being noticed. These systems use advanced sensors and smart technology to track your vital signs, such as heart rate and breathing, contributing to safer driving experiences.

Driving requires full attention and quick reactions, but health issues like fatigue, stress, or sudden medical problems can make it dangerous. Traditional health monitoring devices are often bulky or uncomfortable, making them impractical for use in a car. This research focuses on creating systems that can continuously and discreetly monitor your health using sensors built into the car's seats.

This study merges concepts from healthcare technology, electronics, and physics to innovate in-car health monitoring. The sensors, including photoplethysmography (PPG) for heart rate measurement, electrocardiogram (ECG) for tracking heart activity, and a breathing rate sensor, are seamlessly integrated into the car's infrastructure, ensuring discreet monitoring without disrupting the driving experience.

Tests with these systems in cars showed that they can accurately monitor vital signs without distracting the driver. The sensors provided reliable readings, confirming their ability to detect when drivers were tired or stressed. Because the system is unobtrusive, drivers could concentrate on the road, enhancing overall safety.

This research has the potential to revolutionize road safety and health monitoring. By continuously and unobtrusively monitoring drivers' health, these systems can help prevent accidents caused by medical emergencies or fatigue. They also provide valuable insights into a driver's well-being, allowing for timely interventions that can improve overall health.