MOTOR MATTERS
TECH OUT MY NEW CAR
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HEADLINE: Cars to Scan Human Body for Healthier, Safer Motoring

Medical-related technology could become integrated into cars of the future for safer and healthier driving. Researchers are working on technology to detect heart rates, brain waves, blood pressure, and even blood sugar levels -- all to help the driver be safe and healthy. Research continues in the area of preventing drunk driving, too.

-- Skin Deep Alcohol Detection

The best way to stop drunk driving accidents is to keep those with unsafe alcohol levels off the road, which can be done with technology. Currently, there are alcohol ignition interlock devices available that require the driver to blow into a device before the car will start. These devices are often mandated by courts for DUI convictions and are very costly.

But now a high-tech firm in Waterloo, Ontario, Canada, called Sober Steering, developed a touch-based alcohol interlock that is installed on the steering wheel. Upon ignition, a driver places a hand on the biosensor pad in the wheel, which detects alcohol by touch. If alcohol detected exceeds a pre-set limit, then the vehicle is immobilized and an instant message is sent to dispatch (or parents). Random retests ensure that the driver maintains sobriety while en route. Advanced biosensors analyze the gases exuded from the skin to non-invasively diagnose the body's condition. Sensors can detect alcohol at the palm of the hand in less than five minutes after initial ingestion.

"Sober Steering is first concentrating on installation in school buses," said Catherine Carroll, CEO of Sober Steering. The company will then expand to fleet vehicles, such as those carrying hazardous materials. The technology can be retrofitted into existing cars.

-- Blood Sugar Sensing

Another Waterloo-based company, Intelligent Mechatronic Systems develops DriveSync software for insurance companies, departments of transportation and fleet management. The company has a working Fiat, called the IMS Connected Car that demonstrates possible future technology.

The connected car platform senses if a driver is hungry by integrating data from a wearable device such as non-invasive optical scanner or contact lenses that detect glucose levels. The devices communicate to the system via Bluetooth, says Dr. Ben Miners, vice president Innovation, IMS.

When the glucose level is low the driver receives a verbal warning asking if the driver is ready to drive and suggests that the driver be "refreshed if possible."

"The glucose level feature can be helpful to diabetics, long haul truck drivers or any driver, depending on their willingness to be monitored," said Dr. Miners.

The system can also monitor sleep and abnormal heart rates to signal driver drowsiness and alert the driver. Currently, the DriveSync connected car platform is deployed by car insurers to give drivers personalized audible coaching, as well offer discounts for good driving. The company also makes systems to coach new young drivers. Systems can be deployed through a smartphone app or an OBD-II device connected to the vehicle. (Note: the sensors used in the vehicle for glucose are not commercially available yet).

-- Alertness of an Astronaut

Jaguar Land Rover is testing ways to monitor well-being and concentration of drivers. Based on a technique used by NASA to improve concentration, sensors detect brainwaves through the hands via sensors embedded in the steering wheel to determine if the driver is focused, daydreaming, sleepy, or distracted. When the driver is daydreaming or distracted the steering wheel or pedals could vibrate as a warning or an audio alert can be sounded.

Jaguar Land Rover is also evaluating how a vehicle could monitor the well-being of the driver using a medical-grade sensor embedded in the seat of a Jaguar XJ. The sensor detects vibrations from the driver's heart beat and breathing. In cases of emergencies the car can be programmed to call for help.

Monitoring physical health will also allow the car to monitor driver stress levels. For example, to help reduce stress the car may change mood lighting, audio

settings and climate control.

-- Doctor on Board

Since cars are becoming giant computers, their computing power can be used to wirelessly connect to health monitoring devices and then alert the driver or even medical professionals.

Ford patented a vehicle computing system that goes further than monitoring health issues for safe driving, titled "Medical data acquisition and provision." The computer gathers information from wireless health monitors than can detect heart rate, blood pressure or weight. A remote doctor can be sent stored information with the driver's permission. The system can be programmed so that drivers and their doctor are warned if there's a problem and even call the doctor or 911 in case of emergency.

"Integrating medical information into cars is important because today all cars do is monitor how the car is driving, not human behavior," said Dr. Miners, "Biomedical devices will help understand driving behavior for more effective driving and safety."

(Note: Ford stopped research on the Heart Rate monitor seat and is instead connecting to wearables). -- Lynn Walford, Motor Matters

Manufacturer Photo:

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