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UNIVERSIDADE BEIRA INTERIOR

CENTI

BORGSTENA textile solutions

Smart seat cover for vehicle seats that includes a vital signs sensors network, embedded in upholstery for monitoring the physiological state of the driver or passengers. The integrated sensors monitor subject's breathing (bio-radar) and several comfort parameters, such as humidity, pressure and temperature. All sensors were developed using the System on Substrate (SoS) technology, sharing the same textile substrate.

Tech offer | Vehicle seat cover with a monitoring system

Road safety is currently one of the major societal challenges, and its improvement has been a research target in many countries. The driver physiological state monitoring can be a solution to avoid danger situations and improve road safety. Current solutions include sensor networks integrated in car seats, nevertheless, such sensors require a direct contact with the subject, or they are manufactured with conventional rigid materials.

This invention presents a novel approach to monitor the comfort and physiological state of the driver while driving to reduce the risk of accidents caused by fatigue, sleepiness and others. This was possible through the development of a smart seat cover, compatible with the fabrication processes of textiles that can then be used in car seats.

This system encompasses a fully embedded textile sensor network, which includes a bio-radar system (for breathing monitoring) and additional comfort sensors, such as temperature, humidity and pressure sensors.

APPLICATIONS

MONITORING SYSTEMS FOR VEHICLE SEATS:

- Automotive industry
- Aeronautical industry

BENEFITS

STREAMLINED MANUFACTURING: System on Substrate (SoS) technology – all sensors share the same textile substrate.

BETTER USER EXPERIENCE: the continuous contactless monitoring provides a more comfortable and safe driving experience.

MULTI-PARAMETER REAL-TIME MONITORING allows subsequent development of other features, such as driver assistance systems for emergency situations and comfort automatic control (e.g. temperature and ventilation).

BABY MONITORING: the system can be adapted for the monitoring of other vehicle occupants, such as babies, infants and other individuals with special needs.

INTELLECTUAL PROPERTY

Pending international patent application (PCT/IB2021/059011)

TECHNOLOGY ID

PI-1022

SCIENTIFIC PUBLICATIONS

- C. Loss, C. Gouveia, R. Salvado, P. Pinho, J. Vieira, "Textile Antenna for Bio-Radar Embedded in a Car Seat", Materials 2021, 14, 213. DOI: 10.3390/ma14010213

INVENTORS

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- Instituto de Telecomunicações
- Universidade da Beira Interior
- CENTITVC – Centre for Nanotechnology and Smart Materials
- Borgstena Textile Portugal

DEVELOPMENT STAGE

TRL 5
The prototype consisting of a car seat cover is available for public presentation.

The prototype was built with a certified textile structure and was validated in a lab scale environment via use-simulation and live user tests.
The solution was validated using normalized tests for electronic and electrical equipment related to human exposure restrictions for electromagnetic fields, according to EN62311(200), obtaining a score of 0,62 V/m, approximately 1% of the legal limit.
The technology was developed considering all the industrial process specificities providing a viable commercial implementation.

KEYWORDS

Continuous monitoring
Contactless sensors
Bio-radar
Road safety
Textile SoS
Textile sensors
Textile antennas
Seat cover

TARGET MARKET & COMMERCIAL OFFERING

The Consortium seeks partners within the automotive and aeronautical industries, namely vehicle seat manufacturers (OEMs), for further developments and testing of new applications or to license the technology.

CONTACT

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