

HMI | Sensor Systems | Automotive | Sensor Technology | Technology Offer

Individual Workload and Strategy Assessment – IWSA: Ocular based state-detection for HMI interfaces

Field of application

To achieve effective and sustainable improvements in socio-technical systems and to avoid incidents/accidents, human-machine interfaces (HMI) must be continuously checked and, if necessary, optimized in terms of human requirements. Due to its variable cognitive and physiological properties, the factor human being is our most important source of information, but it is also extremely complex and cannot be sufficiently quantified and harnessed using current collection methods. The accessibility of information by the system can only be optimized through a thorough understanding of the individual user.

A system that analyzes and quantifies users individually and based on that information not only takes safety precautions, but also suggests system adaptations (general or individual), is well worthwhile when dealing with complex, protracted or high responsibility tasks (plant management, control rooms, etc.).

State of the art

Current physiological recording approaches are not suitable for examining a user state in a standardized way, as the evaluation procedures cannot be adapted to individual users and take their individual strategies into account ("one fits all" strategy).

Innovation

The Karlsruhe Institute of Technology (KIT) has developed an evaluation system based on ocular based parameters that now account for the inter- and intra-individual characteristics of users. The system therefore requires a gaze detection system. Based on a calibration task carried out before the actual activity is analyzed, an individual stress model is created to optimize the interface depending on the cognitive state and behavior of the user.

Thanks to this calibration to the individual user, now the cognitive state, operationalized via performance and subjective perception, can be continuously collected and quantified solely via physiological parameters. This allows for an unprecedented level of efficiency in setting up individual working environments.

[see also DOI: 10.5445/IR/1000070025]

Your benefits at a glance

- ✓ Quantification of the cognitive state of users on a standardized, comparable scale
- ✓ Application-independent and especially suitable for demanding or highly-specialized tasks
- ✓ Subjective perception, performance and cognitive efficiency as references for cognitive state
- ✓ Immediate derivation of design measures
- ✓ Active avoidance of mental overload

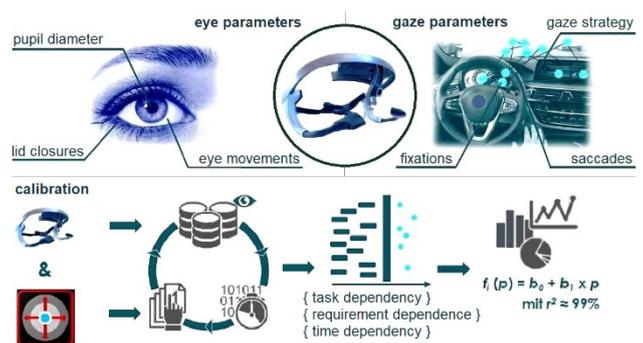


Figure: Overview of entry parameters and evaluation strategy of the IWSA system [Image: KIT].

Technology transfer

TLB GmbH manages inventions until they are marketable and offers companies opportunities for license and collaboration agreements.

Patent portfolio

A European patent application is pending.

Contact

Anne Böse, Business Development
boese@tlb.de
 Technologie-Lizenz-Büro (TLB)
 der Baden-Württembergischen Hochschulen GmbH
 Ettlinger Straße 25, D-76137 Karlsruhe
 Tel. 0721 79004-0, Fax 0721 79004-79
www.tlb.de

Reference number: 16/111TLB