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Road vehicles — Measurement and analysis of driver visual behaviour with respect to transport information and control systems

Véhicules routiers — Mesurage et analyse du comportement visuel du conducteur en relation avec les systèmes de commande et d'information du transport

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 39, *Ergonomics*.

This edition cancels and replaces ISO 15007-1:2014 and ISO/TS 15007-2:2014, which have been technically revised.

The main changes compared to the previous editions are as follows:

— integration of ISO 15007-1 (*Part 1: Definitions and parameters*) and ISO/TS 15007-2 (*Part 2: Equipment and procedures*) into one document;

— detailed description of different data reduction procedures;

— detailed description of procedures and criteria for quality assurance.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document supports the quantification and description of visual behaviour while using TICS (transport information and control systems) and driving vehicles in different driving levels of automation. It supports the quantification of information acquisition related to internal and vehicle external environment/objects (e.g. vehicles, billboards, information displays, variable message signs).

It provides assistance in the assessment of driver state considering visual attention. This document does not address fatigue and drowsiness.

This document describes the phases of visual behaviour assessment including the following steps:

— calibration setup and calibration verification (piloting phase);

— data collection;

— data reduction;

— quality assessment;

— data presentation.

Each of these steps should be handled with care, documented and checked for quality before moving to the next step.

Road vehicles — Measurement and analysis of driver visual behaviour with respect to transport information and control systems

1 Scope

This document defines key terms and parameters applied in the analysis of driver visual behaviour focused on glance and glance-related measures. It provides guidelines and minimum requirements on equipment and procedures for analysing driver visual behaviour including assessment of TICS to:

— plan evaluation trials;

— specify (and install) data capture equipment; and

— validate, analyse, interpret and report visual-behaviour metrics (standards of measurement).

The parameters and definitions described below provide a common source of reference for driver visual behaviour data.

It is applicable to on-road trials (e.g. field operational tests or naturalistic studies), and laboratory-based driving studies. The procedures described in this document can also apply to more general assessments of driver visual behaviour. Data collected and analysed according to this document will allow comparisons to be performed across different TICS applications and experimental scenarios.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Basic terms

3.1.1
area of interest
AOI
pre-determined area within the visual scene

Note 1 to entry: Region of interest (ROI) is used as a synonym.

Note 2 to entry: An AOI will be no smaller than the normal resolution of the eye-measurement system being used (e.g. no smaller than 0,5 ° for typical eye tracking systems). See F.1.

EXAMPLE A rear-view mirror.