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Performance requirements and test methods for driver attention monitoring system

驾驶员注意力监测系统 性能要求及试验方法

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020, *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*.

Please note that some contents of this document may involve patents. The issuing organization of this document is not responsible for identifying patents.

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This document shall be under the jurisdiction of National Technical Committee of Auto Standardization (SAC/TC 114).

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Performance requirements and test methods for driver attention monitoring system

1 Scope

This document specifies the general requirements, performance requirements and test methods for driver attention monitoring system (hereinafter referred to as the “system”).

This document applies to M and N vehicles which are equipped with a driver attention monitoring system based on image recognition technology. It can be used as a reference for the implementation of other systems with the same function.

2 Normative references

The following documents are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 10000, Human dimensions of Chinese adults

GB 10810.3, Spectacle lenses and related eye wear - Transmittance specifications and test methods

GB 34660, Road vehicles - Requirements and test methods of electromagnetic compatibility

GB/T 39263, Road vehicles - Advanced driver assistance systems - Terms and definitions

3 Terms and definitions

Terms and definitions determined by GB/T 39263 and the following ones are applicable to this document.

3.1 Driver attention monitoring system; DAMS

A system that monitors the driver’s state in real time and sends a prompt message when it is confirmed that the driver is distracted.

3.2 Distraction

The state in which the driver is unable to concentrate on performing the driving task due to fatigue driving, interference from the external environment, or actions unrelated to driving while driving the vehicle.

3.3 Abnormal head pose

The behavior where the front-back tilt angle and horizontal rotation angle of the head exceed the normal range when the driver raises the head, lowers the head, or shakes the head left and right.

3.4 Accuracy rate

The ratio of the number of correct detections of a behavior to the number of detection events (number of correct detections + number of false detections).

Note: The number of false detections is the number of false events that are detected as real events.

3.5 Detection rate

The ratio of the number of correct detections of a behavior to the number of real events (number of correct detections + number of missed detections).

Note: The number of missed detections is the number of real events that are not detected as real events.

3.6 Humanoid robot

A robot, with the appearance of human, which is programmed to mimic human movements.

4 General requirements

4.1 Functional requirements

The system shall be equipped with the functions of real-time monitoring of the driver's eye closing, abnormal head pose, hand-held phone answering and calling, and can be provided with the function of monitoring the driver's yawning or smoking behavior, and sending a prompt message when the corresponding conditions are met. The system should be provided with an interface for transmitting and storing prompt messages, and the data recorded by the system should be used only for the determination of monitoring the driver's state.

4.2 Self-inspection

The system shall perform self-inspection after power-on and shall have at least the following self-inspection functions: