P2520

Type of Project: New IEEE Standard
Project Request Type: Modify / New
PAR Request Date: 09 Nov 2021
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Root PAR Approved on: 21 Mar 2019

1.1 Project Number: P2520
1.2 Type of Document: Guide
Change to Type of Document: ~~Standard~~ Guide
1.3 Life Cycle: Full Use

2.1 Project Title: Guide for Testing Machine Olfaction Devices and Systems
Change to Title: ~~Standard~~ Guide for Testing Machine Olfaction Devices and Systems

3.1 Working Group: Testing Machine Olfaction Devices and Systems Working Group(SEN/SC-SC/TMODS)
3.1.1 Contact Information for Working Group Chair:
Name: Susan Schiffman
Email Address: schiffmansusan@gmail.com
3.1.2 Contact Information for Working Group Vice Chair:
None
3.2 Society and Committee: IEEE Sensors Council/Standards Committee(SEN/SC-SC)
3.2.1 Contact Information for Standards Committee Chair:
Name: H Troy Nagle
Email Address: t.nagle@ieee.org
3.2.2 Contact Information for Standards Committee Vice Chair:
Name: Gerard Hayes
Email Address: gerardjameshayes@gmail.com
3.2.3 Contact Information for Standards Representative:
None
3.3 Co-Stds Committee(s):
3.3.1 IEEE Industrial Electronics Society/Industrial Electronics Society Standards Committee (IES/IES)
Contact Information for Standards Representative:
Name: Victor Huang
Email Address: vklhuang@aol.com

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Jun 2022
Change to Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: ~~Jan~~ Jun ~~2021~~ 2022
4.3 Projected Completion Date for Submittal to RevCom: Oct 2022
Change to Projected Completion Date for Submittal to RevCom: Oct ~~2021~~ 2022

5.1 Approximate number of people expected to be actively involved in the development of this project: 20
5.2 Scope of proposed standard: This guide provides an overview of the P2520 series of standards for testing methods and conformance processes to ensure that machine olfaction devices and systems achieve reliable and reproducible results that are comparable to human odor panels.
Change to scope of proposed standard: This ~~standard~~ guide provides an overview of the P2520 series of standards for testing methods and conformance processes to ensure that machine olfaction devices and systems achieve reliable and reproducible results that are comparable to human odor panels.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: The purpose of these standards is to establish a collection of performance measurement methods and conformity assessment processes for machine olfaction systems and devices employed in focused application areas. The Guide will assist users to choose an appropriate standard in the series for

their specific application. These standards can be used to compare the threshold sensitivity, the intensity of response with increasing concentrations of suprathreshold stimuli, and qualitative responses from e-instruments with those of human panels. In addition, other parameters such as adaptation (the reduction in intensity that occurs with repetitive presentation of a stimulus), the time course of intensity (e.g., slow onset or persistent lingering), the impact of temperature including hot or cold stimuli, and hedonic properties (pleasantness or desirability) are addressed as needed. Standard algorithms for advanced signal processing are provided for e-sensing instruments that can augment, compete, and/or replace human responses. Our formal standards for analyte selection, signal processing algorithms, and performance evaluation empower companies to introduce new generations of e-noses that simulate human chemosensory responses with greater accuracy and precision.
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5.5 Need for the Project: Dozens of commercial e-nose devices have become available over the last two decades. Startup companies have emerged and marketed their devices widely around the world. Unfortunately, most of these efforts have failed because the return on investment promised to purchasers has not been achieved. Our standards in specific application areas will help companies develop devices and systems that meet their return on investment promises.
5.6 Stakeholders for the Standard: The stakeholders include government regulators, vendors, manufacturers, system integrators, and users of odor measurement and monitoring devices and systems. Application areas include environmental air and water quality, medical monitoring, food and beverage, product quality and contamination, forensics, and military.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

7.1 Are there other standards or projects with a similar scope? No
7.2 Is it the intent to develop this document jointly with another organization? No

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8.1 Additional Explanatory Notes: Reference: H. Troy Nagle and Susan S. Schiffman, "Electronic Taste and Smell: The Case for Performance Standards," Point of View, Proceedings of the IEEE, Vol. 106, No. 9, pp., 1471-78, September 2018, DoI: 10.1109/JPROC.

During the first year of the P2520 Working Group (WG), a consensus was developed that a single standard could not cover all the potential application fields. The WG subsequently developed a comprehensive breakdown of application testing categories and changed P2520 to be used as a guide to introduce the Standard Series and provide suggestions on sampling, sensors, signal processing, testing setups, conformity procedures, and the like. Five of the new WGs are active.
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