

# P3333.1.1

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**Submitter Email:** [slee@yonsei.ac.kr](mailto:slee@yonsei.ac.kr)

**Type of Project:** Modify Existing Approved PAR

**PAR Request Date:** 09-Jul-2014

**PAR Approval Date:** 21-Aug-2014

**PAR Expiration Date:** 31-Dec-2015

**Status:** Modification to a Previously Approved PAR

**Root PAR:** P3333.1 **Approved on:** 31-Mar-2011

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**1.1 Project Number:** P3333.1.1

**1.2 Type of Document:** Standard

**1.3 Life Cycle:** Full Use

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**2.1 Title:** Standard for the Quality of Experience (QoE) and Visual Comfort Assessments of Three Dimensional (3D) Contents Based on Psychophysical Studies

**Changes in title:** Standard for the Quality of Experience (QoE) and Visual Comfort Assessments of Three Dimensional (3D) Contents based on Psychophysical Studies

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**3.1 Working Group:** Quality Assessment of Three Dimensional (3D) Contents based on Psychophysical Studies Working Group (C/SAB/P3333.1\_WG)

**Contact Information for Working Group Chair**

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**3.2 Sponsoring Society and Committee:** IEEE Computer Society/Standards Activities Board (C/SAB)

**Contact Information for Sponsor Chair**

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**4.1 Type of Ballot:** Individual

**4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:** 08/2014

**4.3 Projected Completion Date for Submittal to RevCom:** 02/2015

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**5.1 Approximate number of people expected to be actively involved in the development of this project:** 10

**5.2 Scope:** This standard establishes methods for visual saliency prediction, visual contents analysis, and subjective assessment for quantifying the visual discomfort and quality of experience (QoE) of 3D image and video.

**Changes in scope:** This standard establishes methods for visual discomfort, saliency prediction, quality of experience (QoE) assessments of 3D contents based on analysis, and psychophysical subjective assessment. This standard also identifies and quantifies the following: causes of visual fatigue, discomfort and QoE degradation: visual contents, such as disparity, camera setting, flicker, frame rate, contrast, luminance, color, and object velocity; visual environment characteristics, such as light transfer, viewing distance, intensity of illuminance, experience and viewing freedom; display characteristics, such as 3D display type (glass or non-glass type QoE), display of size, color, resolution, refresh rate, and crosstalk; Key items needed to characterize the 3D database image in terms of the human visual system. These key factors are constructed in conjunction with the

**5.3 Is the completion of this standard dependent upon the completion of another standard?:** No

**5.4 Purpose:** This document will not include a purpose clause.

**5.5 Need for the Project:** According to Industry trend reports, the 3D industry can leverage new growth of a higher value-added business such as movies, broadcasting, games, and advertising as the 3D individual technologies are growing in the field of 3D content, display and devices, and following services converging and integrating.

The size of the world-wide 3D market is estimated to become four hundred billion dollars in 2013, and to grow by 25% to more than five hundred billion dollars in 2014. In parallel with the development of various 3D techniques for 3D applications, there is a need for extensive efforts in developing objective 3D image and video quality metrics designed to evaluate visual quality in agreement with subjective human judgments.

As the demand and supply for 3D technologies grow, the development of accurate assessment techniques must be performed to develop the industries of the 3D display devices, and signal processing engines

**5.6 Stakeholders for the Standard:** Manufacturers of 3D contents, 3D games, 3D devices including 3D display and 3D educational programs; Developers of 3D signal processing engines; Service providers of 3D display contents such as movie, TV shows, games, etc.

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## Intellectual Property

**6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?:** No

**6.1.b. Is the Sponsor aware of possible registration activity related to this project?:** No

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**7.1 Are there other standards or projects with a similar scope?:** No

## 7.2 Joint Development

**Is it the intent to develop this document jointly with another organization?:** No

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**8.1 Additional Explanatory Notes (Item Number and Explanation):** 3.2 - As part of this PAR modification Sponsorship of this PAR is being moved from BOG/CAG to C/SAB. 4.1 - This project is being switched from entity to individual balloting. (Readiness for standardization)

In order to make the progress of standard activity, we need international participation and collaboration. In addition, technically, we need an associated project to work with the working group. This project will be a technical sponsor to verify whether the technical standard issues are important or not. Since this project is world-wide, we expect that a lot of industry and academy in the signal processing area will join the activity.

In Korea, we have a government organization named 'Korea Electronics Association', which supports such standard initiation and activity as long as the technologies are important in near future. In the 3D-processing meeting group, major academy, industry, and government research institutes have been working on the preparation of coming world-wide standard activity. (Distinct identity)

Despite of the potential for the great market growth, the 3D-related companies put off the aggressive investment for various 3D industries and 3D device commercialization. That is why there is no distinct solution to instability for the supply for 3D **products**. However, the qualitative improvement which this project brings **out can lead to** the quantitative expansion for 3D **products'** supply simultaneously. (Adequate participants)

Once the WG is relaunched as an Individual based WG, it will be open to all individual contributors. We expect that many companies including manufacturers of 3D display devices and service providers of 3D contents should participate **in the effort** of this project, which may lead **to** the 3D-related markets growth rapidly.

The purpose of this standard is to define quality metrics for the quality assessment, and establish guidelines for reducing risks to users entertaining 3D **image and video** over 3D displays, and 3D devices. The major parameters dealt with in this standard include viewers' characteristics, visual contents, visual environment, display and devices described in the scope. Although metrics and methods for assessing quality of images and videos on 2 dimensional (2D) displays have been established, there has been little progress in doing so in the field of the 3D domain. This is, in part, due to the fact that 3D quality metrics need to take into account additional factors accrued from the dimension extension. Since the visual quality is eventually determined by the human eye, this standard will define how each human factor **affects** the visual quality over the 3D domain. This standard provides objective 3D image and video quality metrics that are in agreement with subjective human judgments and previous researched in the academy and the industry.