

P3333

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Type of Project: New IEEE Standard

PAR Request Date: 18-Feb-2011

PAR Approval Date: 31-Mar-2011

PAR Expiration Date: 31-Dec-2015

Status: PAR for a New IEEE Standard

1.1 Project Number: P3333

1.2 Type of Document: Standard

1.3 Life Cycle: Full Use

2.1 Title: Standard for the Quality Assessment of Three Dimensional (3D) Displays, 3D Contents and 3D Devices based on Human Factors

3.1 Working Group: 3D Human Factors Working Group (BOG/CAG/3DHF_WG)

Contact Information for Working Group Chair

Name: Sanghoon Lee

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Contact Information for Working Group Vice-Chair

None

3.2 Sponsoring Society and Committee: IEEE-SA Board of Governors/Corporate Advisory Group (BOG/CAG)

Contact Information for Sponsor Chair

Name: Dennis Brophy

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Contact Information for Standards Representative

None

4.1 Type of Ballot: Entity

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 06/2012

4.3 Projected Completion Date for Submittal to RevCom: 05/2013

5.1 Approximate number of entities expected to be actively involved in the development of this project: 5

5.2 Scope: This standard establishes methods of quality assessment of 3D displays, 3D contents, and 3D devices based on human factors such as photosensitive seizures, motion sickness, and visual fatigue. This standard also identifies and quantifies the following causes of human factors:

viewers' characteristics, such as age, gender, posture, and risk level;

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, and viewing freedom;

display characteristics, such as display size, color, resolution, refresh rate, and crosstalk;

devices, such as 3D glasses and 3D cameras.

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. This is due to 3D content, display devices, and following services converging and integrating.

The size of the world market for 3D display devices is estimated to become several billion dollars in 2011, and to grow by 80% to fifteen billion dollars in 2012. In parallel with the development of various 3D display devices and signal processing techniques for 3D display application, 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 display devices grow, the development of accurate quality assessment techniques must be performed to develop the industries of the 3D display devices, and signal processing engines for 3D displays.

5.6 Stakeholders for the Standard: Manufacturers of 3D devices including 3D monitor, 3D display panel;
Developers of 3D signal processing engines;
Service providers of 3D display contents such like movie, TV shows, etc.

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

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

8.1 Additional Explanatory Notes (Item Number and Explanation): (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 contents. However, the qualitative improvement which this project brings out, leads the quantitative expansion for 3D contents' supply simultaneously.

(Adequate participants)

Once a WG is launched, the WG will be opened to all the people eventually. We expect that many companies including manufacturers of 3D display devices and service providers of 3D contents should participate the effect of this project, which may lead 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 contents 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 makes an effect on 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.