P3333.1.2 (New)

Submitter Email:ceo@joyfun.kr

Type of Project: New IEEE Standard

PAR Request Date: 02-Jun-2016
PAR Approval Date:
PAR Expiration Date:
Status: Unapproved PAR, PAR for a New IEEE Standard

1.1 Project Number:P3333.3
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Title:
Standard for the Perceptual Quality Assessment of HMD(Head Mounted Display)-based MR/VR(Mixed Reality/Virtual Reality) Three Dimensional (3D) Content on Physiological Mechanisms

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
Name: Sanghoon Lee
Email Address: slee@yonsei.ac.kr
Phone:+82-2-2123-2767

Contact Information for Working Group Vice-Chair
None

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

Contact Information for Sponsor Chair
Name: Chuck Walrad
Email Address: cwalrad@daven.com
Phone: +1-650-580-3003

Contact Information for Standards Representative
Name: P. Eastman
Email Address: peastman@cox.net
Phone: +1-602-993-7085

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:
4.3 Projected Completion Date for Submittal to RevCom:

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 of quality assessment of HMD-based MR/VR 3D content on physiological mechanisms such as perceptual quality and visual attention. This standard identifies and quantifies the following:

causes and visual attention of perceptual quality degradation for HMD-based MR/VR 3D image and video contents:
compression distortion, such as multi-view image and video compression,
interpolation distortion by intermediate view rendering, such as HMD-based MR/VR 3D warping, view synthesis,
structural distortion, such as bit errors on wireless/wired transmission errors,
visual attention according to the quality degradation.

Key items needed to characterize the HMD-based MR/VR 3D database in terms of the human visual system. These key factors are constructed in conjunction with the visual factors used to perceptual quality and visual attention.

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: HMD-based MR / VR 3D technology, Oculus lift are merged into Facebook after a first introduction into the world of virtual reality by HMD, while Microsoft has implemented a full-scale MR services through Hololens has attracted attention as a next-generation display technology. In addition, the world's HMD-based MR / VR unit sales are expected to show an annual growth rate of at least about 36%, from 14 million in 2016 to about 38 million units in 2020. In addition, the MR / VR-related H / W and S / W market is expected to grow to about $ 70 billion in 2020.
HMD-based demand and supply, as the increase for the MR / VR 3D technology, the development of accurate perceptual quality evaluation technique is to be carried out proactively to develop the related products and industrial applications.

5.6 Stakeholders for the Standard: Manufacturers of HMD-based MR/VR 3D content, games, display content, educational content, movie makers, HMD-based MR/VR display panel and HMD-based MR/VR devices;
Service providers of HMD-based MR/VR 3D display content such like movie, TV shows, games, 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

---

8.1Additional Explanatory Notes (Item Number and Explanation):
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.
(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 HMD-based MR / VR 3D contents should participate the effect of this project, which may lead the HMD-based MR / VR 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 HMD content over HMD displays, and HMD 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.