

Update on IEEE standardisation activities on Human Factors for Visual Experience (immersive)

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VQEG meeting 9/5/2022

Human Factors for Visual Experience (HFVE)

Chair: Prof Maria Martini, Kingston University London

co-Chair: Prof Patrick Le Callet, University of Nantes

The group focuses on the coordination of VQEG activities in liaison with the IEEE Standards Association Working Groups on HFVE, especially on the following items:

- **Deep Learning-Based Assessment of Visual Experience Based on Human Factors – chaired by Prof Sanghoon Lee, Yonsei University, now approved and published.**

[IEEE SA - Standards Store | IEEE P3333.1.3 \(techstreet.com\)](#)

- **Quality assessment of light-field imaging contents based on human factors – chaired by myself, submitted, Mandatory Editorial Coordination phase, ballot expected to start soon.**
- Perceptual Quality Assessment of Three Dimensional (3D), Ultra High Definition (UHD) and High Dynamic Range (HDR) Contents
- Quality of experience assessment for VR and MR based on human factors

Examples activities:

- Contributions from VQEG members to IEEE Standards on HFVE
- Updates on the status of the standards in VQEG meetings
- Co-located meetings

IEEE P3333.1.3

Standard for the Deep Learning-Based Assessment of Visual Experience Based on Human Factors

Chair: Prof Sanghoon Lee, Yonsei University

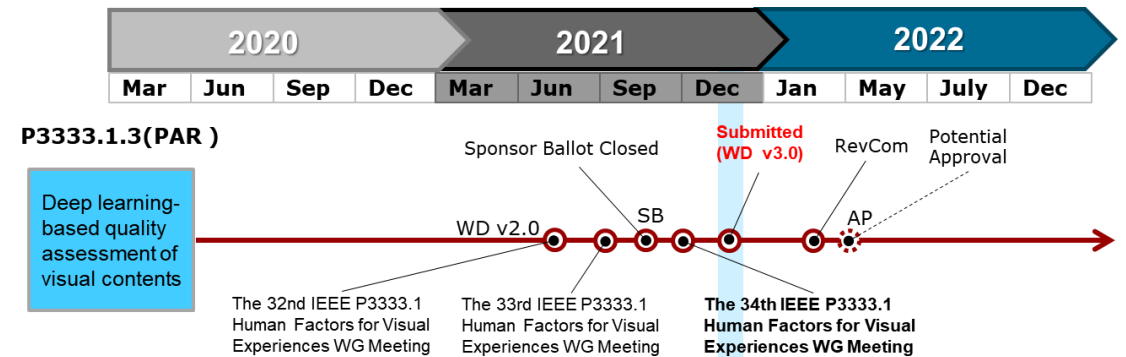
The standard defines and covers

- Deep-learning based metrics of content analysis
- QoE assessment for visual/immersive contents
- Quality assessment of visual contents
- Cybersickness assessment of visual contents
- A database of immersive contents

– Approved as a standard and published

– VR database released online

- VR-SP (VR Sickness & Presence), VR-SP 360 / VR-SP RT Database (360 VR and Ray-Traced VR)



IEEE P3333.1.4

Standard for the Quality Assessment of Light Field Imaging

Chair: Prof Maria Martini, Kingston University London

- Scope

This recommended practice document establishes methods of quality assessment of Light Field visualization based on psychophysical studies. This standard also defines metrics for the quality assessment and establishes criteria for subjective assessment of Light Field imaging, including human factors and judgments, and identifies and quantifies quality degradation including the impact of visual contents, camera settings, compression distortion, interpolation distortion by intermediate view rendering, and structural distortion. The standard addresses a series of visual phenomena that can degrade visualization specifically for Light Field imaging. Visual environment characteristics and viewing conditions are also part of the scope of the standard, including viewing distance, viewer position, viewing freedom, and display characteristics.

- Submitted to the IEEE SA for Initial Standards Committee Ballot
- Expected project Completion Date for Submittal to Review Committee: May 2022

IEEE P3333.1.4

Standard for the Quality Assessment of Light Field Imaging

The current "recommended practice" defines and covers:

- 1) Use cases, acquisition, visualisation and content characterisation
- 2) Influencing factors and impairments for the quality of Light Field imaging
- 3) Subjective assessment of Light Field imaging
- 4) Objective assessment of Light Field imaging
- 5) Datasets

Acknowledgements & next steps

As the first draft standard ("recommended practice") has been submitted, thanks to the excellent working group members of the IEEE SA P3333.1.4 WG!

We expect a revision of this document as technology/research evolves. If you are interested in getting involved in a possible revision, please contact me

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Recent work with also some updates

Kara, P.A., Tamboli, R.R., Shafiee, E., Martini, M.G., Simon, A. and Guindy, M., 2022. Beyond perceptual thresholds and personal preference: towards novel research questions and methodologies of quality of experience studies on light field visualization. *Electronics*, 11(6), p.953.