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Stereoscopic 3D video quality of experience - impact of coding, transmission and display technologies

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Abstract:

Three-Dimensional (3D) videos are riding their success from cinema to home entertainment markets such as TV, DVD, Blu-ray, video games, etc. The video quality is a key factor which decides the success and acceptance of the new service.

This thesis addresses stereoscopic 3D video quality of experience that can be influenced during the 3D video distribution chain, especially in coding, transmission and display stages. 3D video coding and transmission quality has been studied from end-users' point of view by introducing different 3D video coding techniques, transmission error scenarios, error concealment strategies. For display system quality, this thesis compares two types of consumer grade stereoscopic 3D displays: active shutter eye-glasses technology based display and passive polarized eye-glasses technology based display.

The studies have been made on comparison of three major visual ergonomic parameters between two types display: crosstalk, resolution and flicker. This thesis also presents the development of subjective measurement methods for assessing end-users' 3D video experience, as well as the measurement methods for characterizing 3D display system.

The outcome of the thesis can benefit for 3D video industries to improve their technologies in order to deliver better 3D quality of experience to customers.