

User Experience in Relation to Eye Tracking Behaviour in VR Gallery

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Abstract : Contemporary VR technologies allow users to explore virtual 3D spaces where they can work, socialize, learn, and play. User's interaction with GUI and the pictures displayed implicate perceptual and also cognitive processes which can be monitored due to neuroadaptive technologies. These modalities provide valuable information about the users' intentions, situational interpretations, and emotional states, to adapt an application or interface accordingly. Virtual galleries outfitted by specialized assets have been designed using the Unity engine BITSCOPE project in the frame of CHIST-ERA IV program. Users interaction with gallery objects implies the questions about his/her visual interests in art works and styles. Moreover, an attention, curiosity, and other emotional states are possible to be monitored and analyzed. Natural gaze behavior data and eye position were recorded by built-in eye-tracking module within HTC Vive headset gogle for VR. Eye gaze results are grouped due to various users' behavior schemes and the appropriate perpetual-cognitive styles are recognized. Parallely usability tests and surveys were adapted to identify the basic features of a user-centered interface for the virtual environments across most of the timeline of the project. A total of sixty participants were selected from the distinct faculties of University and secondary schools. Users' primary knowledge about art and was evaluated during pretest and this way the level of art sensitivity was described. Data were collected during two months. Each participant gave written informed consent before participation. In data analysis reducing the high-dimensional data into a relatively low-dimensional subspace ta non linear algorithms were used such as multidimensional scaling and novel technique technique t-Stochastic Neighbor Embedding. This way it can classify digital art objects by multi modal time characteristics of eye tracking measures and reveal signatures describing selected artworks. Current research establishes the optimal place on aesthetic-utility scale because contemporary interfaces of most applications require to be designed in both functional and aesthetical ways. The study concerns also an analysis of visual experience for subsamples of visitors, differentiated, e.g., in terms of frequency of museum visits, cultural interests. Eye tracking data may also show how to better allocate artefacts and paintings or increase their visibility when possible.

Keywords : eye tracking, VR, UX, visual art, virtual gallery, visual communication

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