

Web3D Standardization Meeting Minutes

Korea Chapter

July 31, 2017

Date and Location

July 31, 2017, 3 pm – 6 pm (at SIGGRAPH 2017)

Mariott Hotel – Atrium 3, Los Angeles, CA, USA

Supported by KSA (Korean Standards Association) and RRA (National Radio Research Agency)

Attendees

Myeong Won Lee (The University of Suwon, Korea)

Don Brutzman (Naval Postgraduate School, USA)

Nicholas Polys (Virginia Tech, USA)

Richard F. Puk (Intelligraphics Inc., USA and UK)

Anita Havele (Web3D Consortium, USA)

Christophe MOUTON (EDF, France)

Kwan-Hee Yoo (Chungbuk National University, Korea)

Gerard J. Kim (Korea University, Korea)

Alexander Kim (Microsoft, USA)

Moon R. Jung (Seogang University, Korea)

Mitch Williams (Samsung Research of America, USA)

Sean Morrison (BRL-CAD, USA)

Soo-Mi Choi (Sejong University, Korea)

Yun Jang (Sejong University, Korea)

Agenda

- AR/MR/VR (Chair: Gerry Kim)
 - Activities and progress in SC 24 WG 9 (Gerry Kim)
 - Extensions for (1) Haptic simulation and (2) Image based rendering (Gerry Kim)
 - Extensions for multimodal synchronization in VR (Gerry Kim)
 - HMD based service framework (Kwan-Hee Yoo)

- X3D (Chair: Kwan-Hee Yoo)

- X3D C++/C# language binding (Roy Walmsley and Myeong Won Lee)
- X3D chromakey (Myeong Won Lee)
- X3D mobile VR (Myeong Won Lee)
- X3D physical sensors (Myeong Won Lee and Kwan-Hee Yoo)
- 3D data visualization (Kwan-Hee Yoo)
- H-Anim (Chair: Myeong Won Lee)
 - H-Anim facial animation (Jung-Ju Choi and Myeong Won Lee)
 - Representation method for modeling internal respiration organs (Kwan-Hee Yoo and Chan Park)
 - 3D human internal organs representation (Myeong Won Lee)

Minutes

- Myeong Won Lee called the meeting to order at 3:00 pm, July 31, 2017
- This meeting was intended to discuss and advance standardization work items related to X3D and H-Anim with Web3D Consortium members. At this meeting, progress and updates of proposals presented at previous meetings, as well as new work items, were discussed.
- Gerard J. Kim introduced standards being developed in ISO/IEC JTC 1/SC 24/WG 9. WG 9 was formed in 2011, and has been developing standards for computer graphics and virtual environments and implementing MAR based on VR. Current work items are ISO/IEC DIS 18039 MAR reference model, ISO/IEC CD 18040 Live actor and entity representation, ISO/IEC AWI 18038 Sensor representation in MAR, ISO/IEC CD 18520 Benchmarking of vision-based geometric registration and tracking methods for MAR, and ISO/IEC AWI 21858 Information model for MAR contents.
- Gerard J. Kim presented image based rendering for X3D. This relies on a set of two-dimensional images of a scene taken from various viewpoints, and then arbitrary views of the scene are rendered by view interpolation. A light field is described with an array of images. Image based rendering could extend X3D with a Texture node to include camera parameters. In addition, it could create a structure for a separate light field description, and add it to the MAR content information model.
- Gerard J. Kim introduced multimodal synchronization in VR. Multimodal input or output must occur within a short duration of time in order to be recognized as a single event. This leads to two synchronization issues. One is how to specify synchronization by representing multimodal events and behaviors simultaneously or sequentially. The other is how to achieve the synchronization, which is a browser and implementation issue. This topic includes performance benchmarks and methods in scripting API for multimodal I/O.

- Kwan-Hee Yoo presented an HMD based VR service framework. Using X3D, stereo image and 360 images with 3D models can be generated with HMD. The framework consists of functions that represent head tracking, positional tracking, stereoscopic 3D, spatial 3D sound, wide FOV, and orientation tracking, based on X3D. Issues for the HMD VR service using X3D are as follows: interaction of X3D content and HMD devices; fisheye lens; 4K display pixels; 90Hz refresh rate and 100 nits brightness; latency; bandwidth, and seamless message service through smartphones.
- Myeong Won Lee presented on the progress of X3D C++/C# language binding, X3D chromakey, X3D mobile VR, and X3D physical sensors. Updates on these topics were also introduced. X3D C++ and C# CD text preparation and their implementations were briefly introduced. X3D chromakey text preparation for CD and its implementation were demonstrated. For X3D mobile VR, the implementation of a Unity X3D browser was introduced. Importing and displaying an X3D file in Unity, X3D texture mapping, loading X3D H-Anim characters, and generating motion capture animation using BVH in Unity have been implemented. Other X3D functions will be added to the Unity implementation. The work item about X3D physical sensors is an X3D version of ISO/IEC 18038 NWIP Sensor representation in MAR, so that physical sensors can be represented and implemented with X3D.
- Kwan-Hee Yoo presented 3D data visualization as another function for X3D with HTML5. There are five types of X3D data visualization: time series visualization (e.g. bar graph, cumulative graph), distribution visualization (e.g. chart), comparison visualization (e.g. comparative bar graphs), correlation visualization (e.g. tree, graph), and spatial visualization (e.g. map, mark). X3D data visualization is being implemented with d3.js. Several use cases were introduced.
- Myeong Won Lee presented on the progress of H-Anim facial animation. X3D examples using facial regions for facial expression were demonstrated. A CD text is being prepared for ISO/IEC NP submission. In addition, videos explaining how to design H-Anim character models were shown. The video contained guidelines necessary when designing an X3D H-Anim character model using commercial graphics tools.
- Kwan-Hee Yoo presented a representation method for modeling internal respiration organs. All related medical terms were analyzed. 3D models and 3D printing examples of human respiration organs were introduced. Respiratory organs are represented with lower and upper respiratory systems. Details about medical terms and shapes for representing respiratory organs were introduced.
- Myeong Won Lee introduced a new work item about internal organ representation. Standardization topics include representation data model and interface data model for visualizing human internal organs and their functionalities. Difficulties in representing internal organs with stomach regions and layers were discussed. X3D implementation examples of digestive organs were provided.
- The meeting adjourned at 6pm as scheduled. All presentation materials were submitted to the Web3D Consortium.

Thanks are extended to KSA (Korea Standards Association), RRA (National Radio Research Agency), and Ms. Anita Havele, Web3D Executive Director, for supporting such a worthwhile meeting.

Myeong Won Lee

Web3D Korea Chapter Co-Chair