Web3D Consortium
MAR WG Update

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Web3D Consortium
Revitalized Web3D SIG

http://www.web3d.org/working-groups/mixed-augmented-reality-mar

• New generations of hardware technologies
• New Applications
• Target:
  • X3D 4.1
  • Demos at Web3D 2019 and SIGGRAPH
WebVR, X3D, & glTF

- X3DOM branch
- Rolling into new release
Access: WebVR

- X3D and HTML5 files
- Uses the browser as the platform
- Many headsets
Chair and Chief Instigator

Mitch Williams (Samsung)
• GearVR X3D Support
• GearXR X3D Support
• Android Studio builds X3D apps

• Additions to X3D to support MAR
Video AR

- GearXR: http://www.samsungxr.com
  http://www.samsungxr.com/tutorials/simple_sxr_app
See-through AR

- Hololens
- Depth camera for environmental registration
- E.g. v-slam X3D browser in Unity
  - [https://www.v-slam.org/](https://www.v-slam.org/)
Video: X3D visualization of an OWL ontology

Video by Cedrick Ilo
VT Masters student
Prior Work

• Web3D Consortium
  • Unified proposal from Web3D members from Germany, Korea
  • Augmented Reality X3D Nodes
  • ISO Reference Model
  • InstantPlayer PosterTracker
  • X3DOM marker-based AR
X3D MAR proposal Summary

- CalibratedCameraSensor node
- TrackingSensor node
- Viewpoint (add fov Mode and aspectRatio)

- BackdropBackground
- ImageBackdropBackground
  - (should be VideoBackdropBackground?)
Example MAR scene: Video AR

```xml
<CalibratedCameraSensor DEF="camera" />
<ImageBackdropBackground DEF="bg" />
<ROUTE fromNode="camera" fromField="value" toNode="bg" toField="image"/>
<Viewpoint DEF="arview" position="0 0 0" />
<ROUTE fromNode="camera" fromField="fieldOfView" toNode="arview" toField="fieldOfView"/>
<ROUTE fromNode="camera" fromField="fovMode" toNode="arview" toField="fovMode"/>
<ROUTE fromNode="camera" fromField="aspectRatio" toNode="arview" toField="aspectRatio"/>
<TrackingSensor DEF="tracker1" description="OBJECT_FROM_VIEWPOINT" />
<Transform DEF="tracked_object">
  <Shape>
    <Appearance><Material diffuseColor="1 0 0" /></Appearance>
    <Box />
  </Shape>
</Transform>
<ROUTE fromNode="tracker1" fromField="position" toNode="tracked_object" toField="position"/>
<ROUTE fromNode="tracker1" fromField="rotation" toNode="tracked_object" toField="rotation"/>
```
Hot Issues

• Picking with different controllers / gestures
• Lighting from the real environment on virtual objects
• Spec support for Optical see-through MAR (?)
• Occlusion of virtual objects by physical objects
• PBR support in X3D (gltF assets inside X3D scene)
  • X3D Cube map environmental texturing component
Next Steps: Web3D.org

*Continue bi-weekly online meetings*

• Prototype
• Implement: Next Gen demos for Web3D & SIGGRAPH 2019
• Evaluate
• Specify and Standardize