

# Web3D Consortium MAR WG Update

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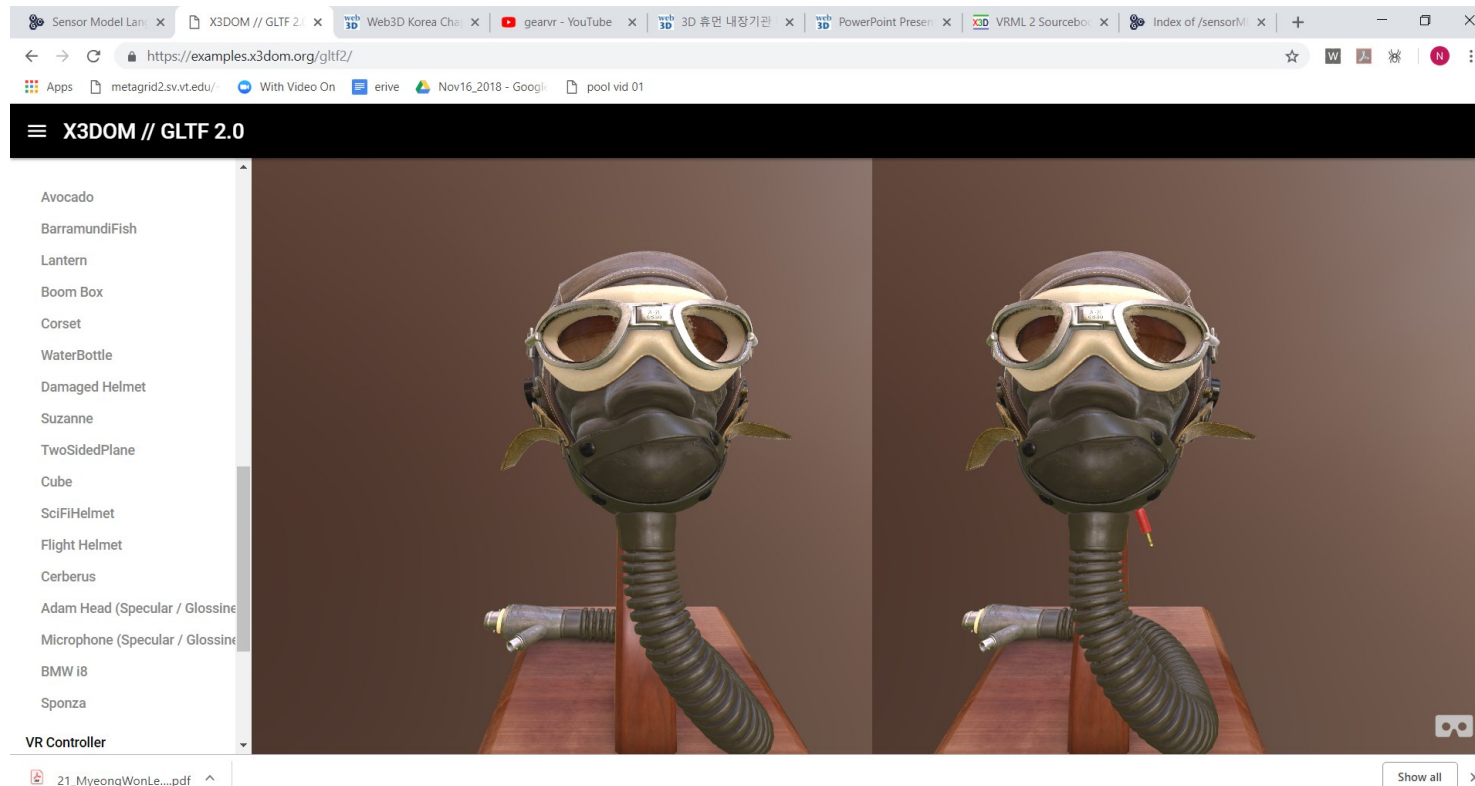
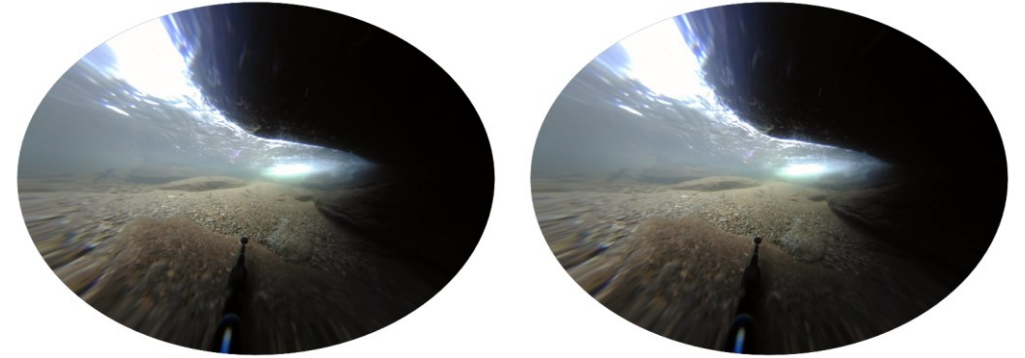
# Revitalized Web3D SIG

<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

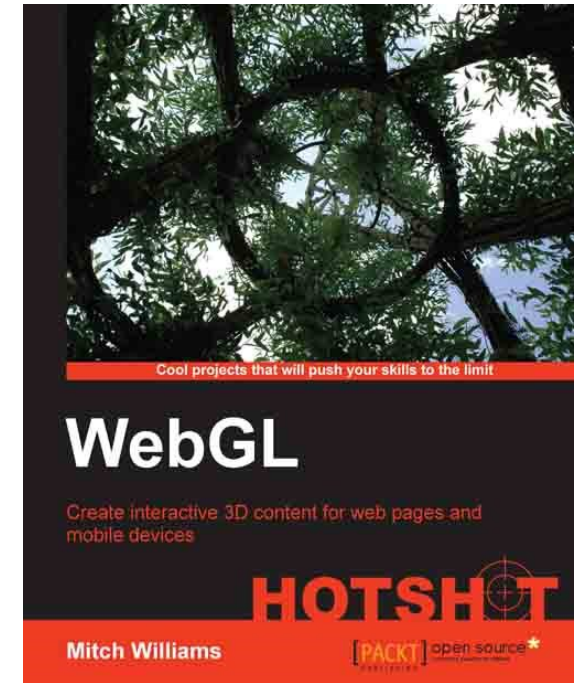
- X3D and HTML5 files
- Uses the browser as the platform
- Many headsets



# Chair and Chief Instigator

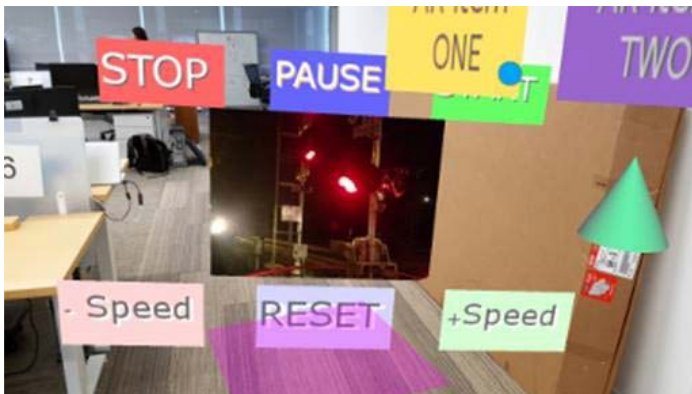
Mitch Williams (Samsung)

- 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](http://www.samsungxr.com/tutorials/simple_sxr_app)

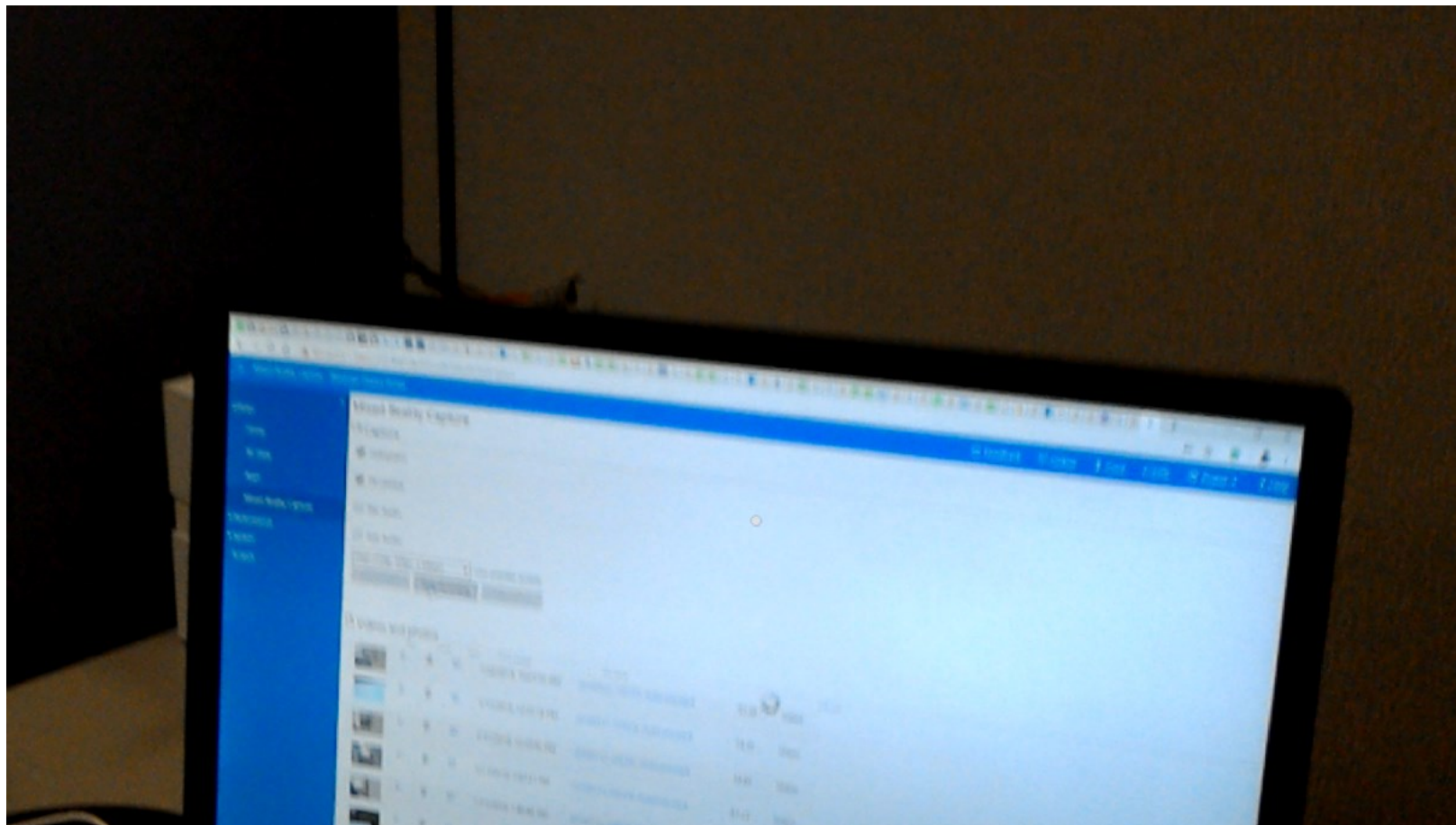


# See-through AR

- Hololense
- Depth camera for environmental registration
- E.g. v-slam X3D browser in Unity
  - <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

- [http://www.web3d.org/wiki/index.php?title=AR\\_Proposal\\_Public\\_Review](http://www.web3d.org/wiki/index.php?title=AR_Proposal_Public_Review)

- 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

```
<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

