# VR Content Generation

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- As follow up to Professor Dunston's presentation on VR/AR applications in construction, I wanted to investigate getting 3D models into a VR environment
- First idea was to download and use the Google Cardboard (cheap VR viewer) SDK, and develop some capabilities for both Android & IOS.
- While this is still desirable, in order to generate native applications, it will be an extended effort.
- Ultimately we want to support higher performance headgear as well: Oculus & Samsung.
- In the mean time, there is a service provided by sketchfab.com which will take a variety of 3D models and render them onto a smartphone which is compatible with a Google Cardboard type device. The communication with the phone has some issues, but you are up and running very quickly.

- Most VR seems to be based on synthetically generated scenes for gaming, entertainment, training, simulation, and design.
- However sometimes you want to provide an immersive look at real scenes.
- Photogrammetry and Laser Scanning provide the best way to generate such real world data.
- For example, you could take the data you generated for the earlier homework exercise, and view it in a VR environment
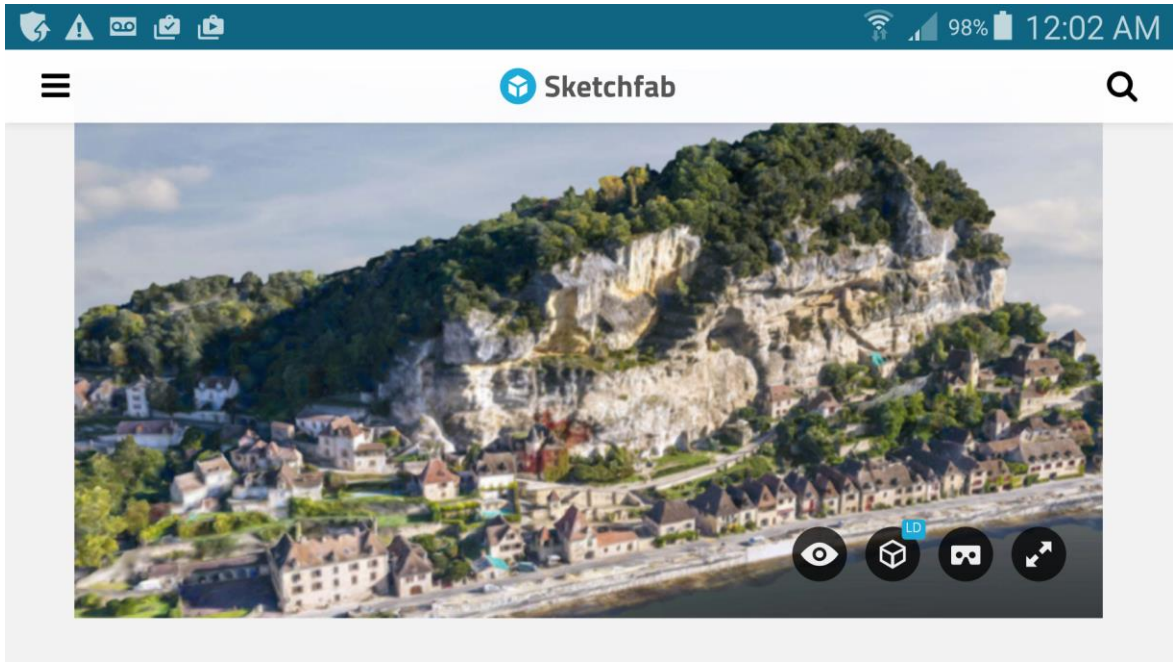
Mono rendering
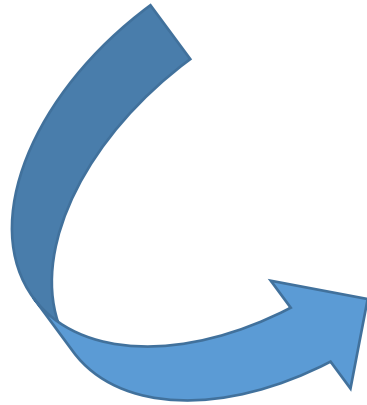
Stereo Rendering by Sketchfab on phone for viewing in "Google Cardboard" environment
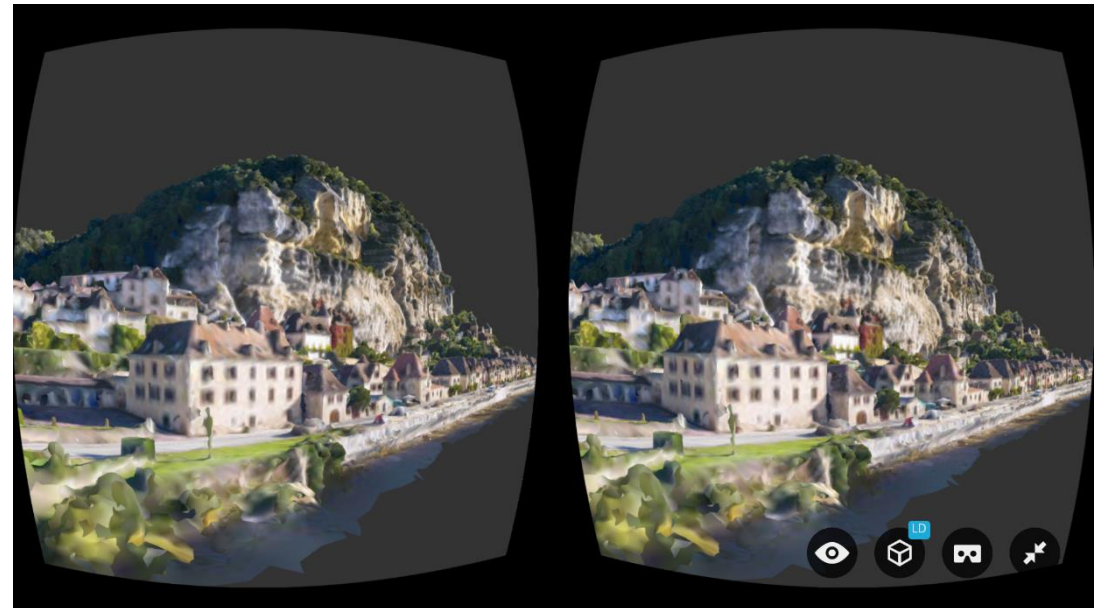
Insert phone into viewer, secure with Velcro. Select the landscape mode which works.

3D Formats readable by Sketchfab for VR rendering

- .3dc   point cloud
- .3ds
- .ac   ac3d
- .asc   ascii, x y z R G B
- .bvh   biovision hierarchy
- .blend   blender
- .geo   carbon graphics
- .dae, .zae   collada
- .dwf   design web format
- .dw   designer workbench
- .x   direct x
- .dxf   autocad
- .fbx   FBX
- .gta   gen. tagged arrays

- .mu   kerbal space program
- .kmz   google earth
- .lwo, .lws   lightwave
- .flt   open flight
- .iv   open inventor
- .osg, .osgt, .osgb, .ive   op. scn. grph.
- .ply   polygon file format
- .shp   shape, ESRI
- .stl   std. tessellation lg.
- .vpk   valve
- .wrl, .wrz   VRML
- .obj   lightwave

Some scenes to look at today

- https://skfb.ly/yup9   cliff caves and village at la roque gageac
- https://skfb.ly/ELPQ   Khumbu glacier
- https://skfb.ly/MTSP   mountain bike
- https://skfb.ly/MY6E   some buildings from photogrammetry class
- https://skfb.ly/MXOv   static laser scan data from back of CE bldg.
- https://skfb.ly/MY6t   airborne lidar data over purdue

Careful, if your phone is too small or too large it will not fit in the viewer. Do not force it.

Note: on Wednesday, April 27 we meet at the Envision Center for a tour of Purdue's high performance VR facilities.