

Pointing at Petroglyphs on the Tablet

Sharing tours of PhotoScan models in Unity 3D



Dr Josh Harle

Australia Council Artist in Residence

Residency Aims

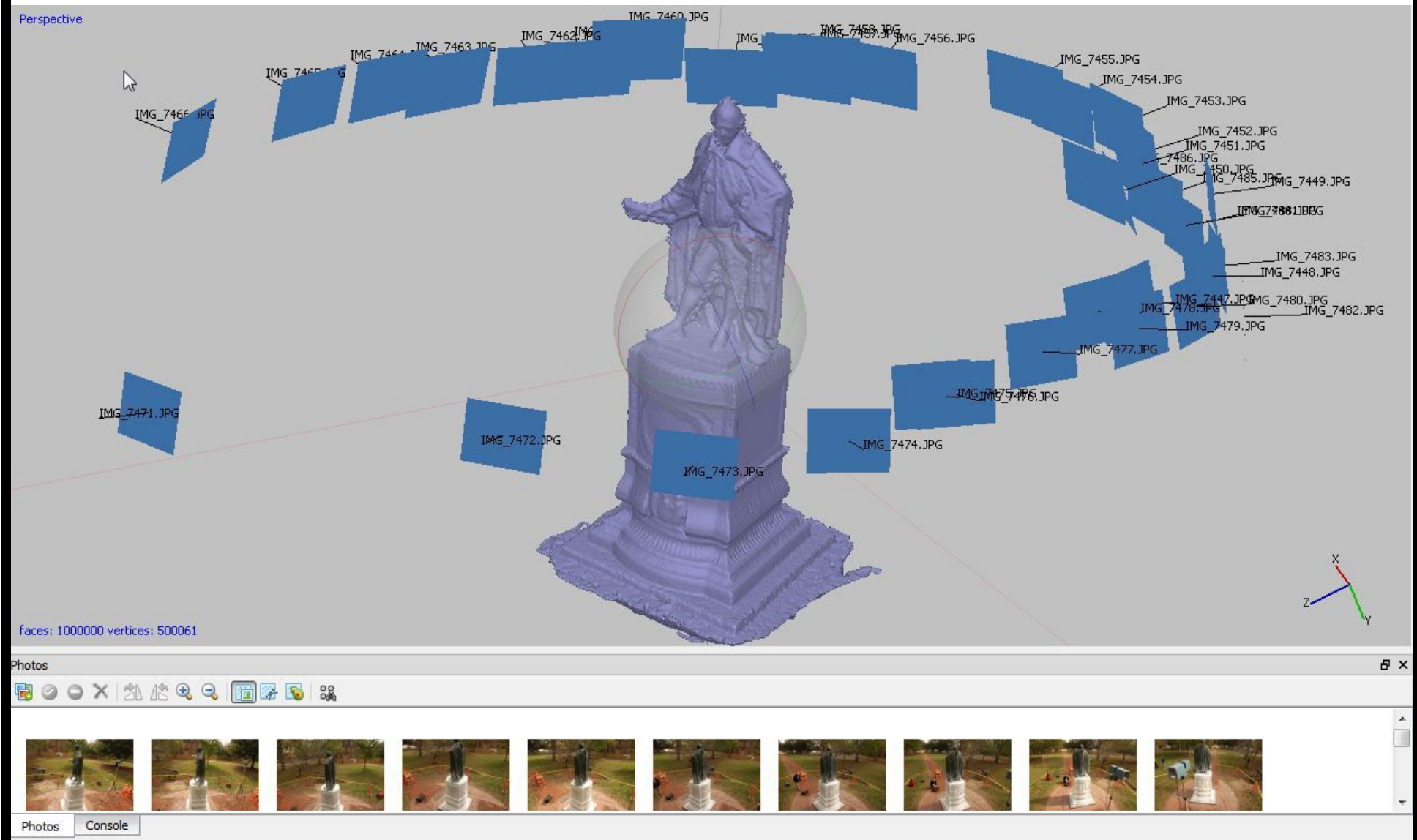
Share-able, atmospheric reconstructions of rock art, with capacity for **tours**

(Tunnel was prototype)



RECAP

Photogrammetry – Standard photogrammetry reconstruction process



Thinking like a game developer

Computer graphics hardware developed in parallel with newest games.



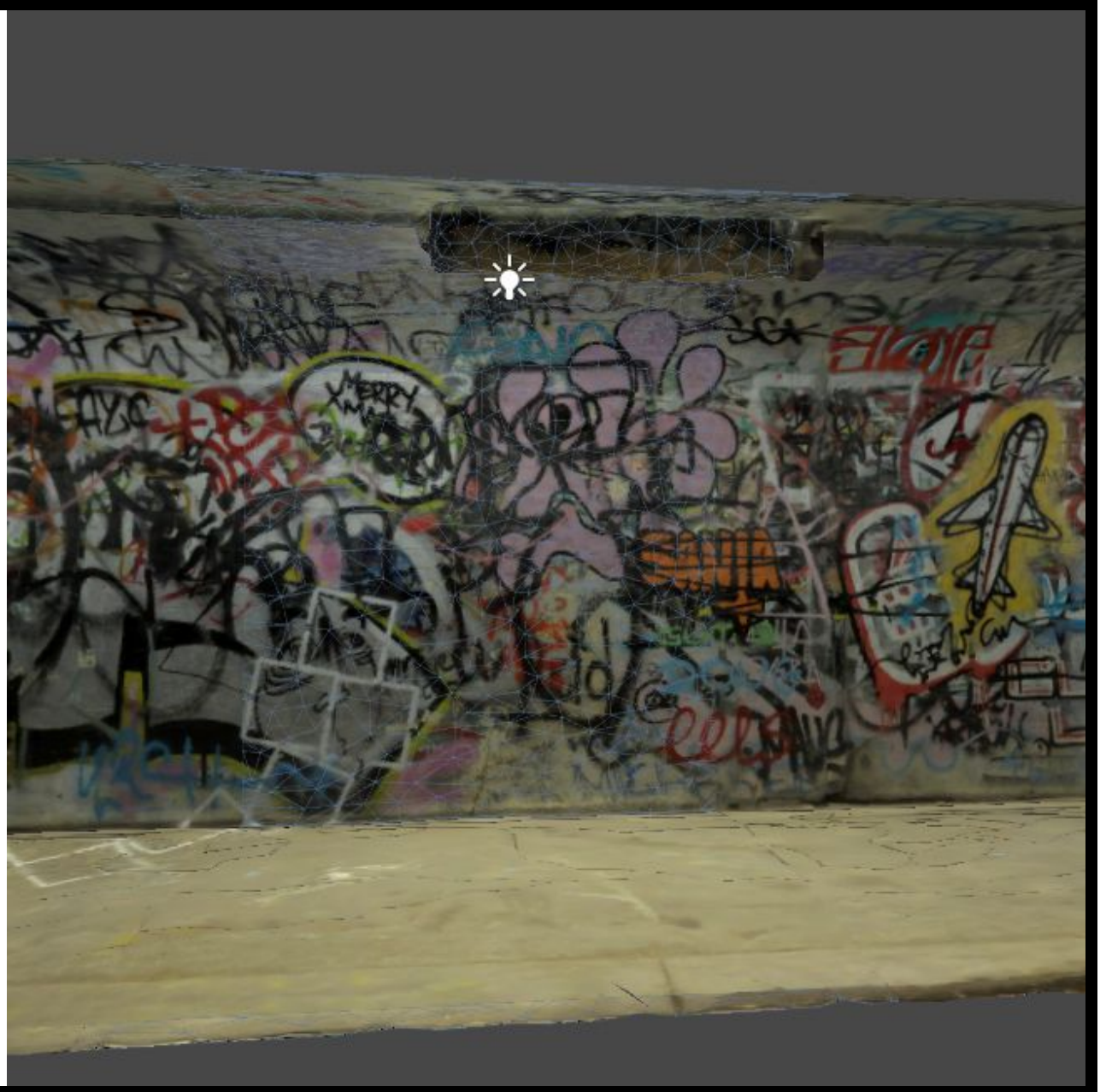
Segmenting

Make a low-poly proxy of the original model.

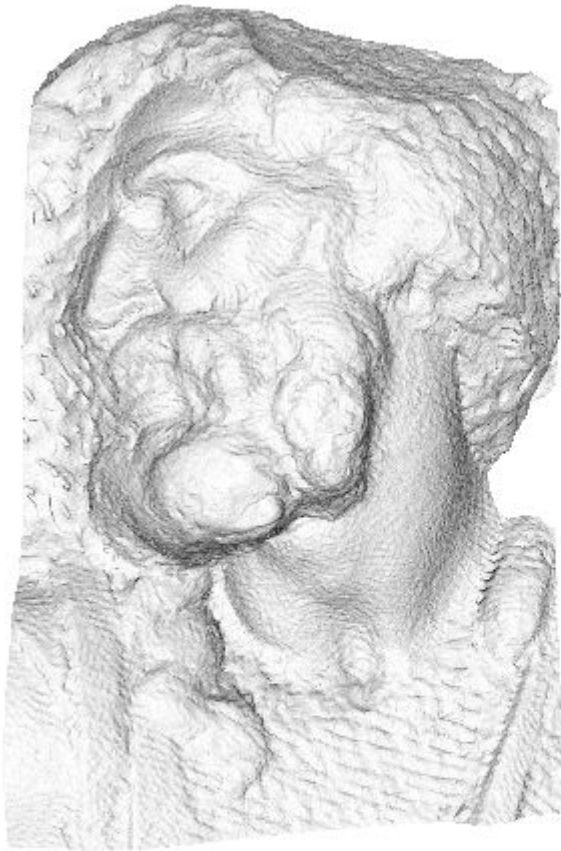
Split it into bite-sized chunks that are small enough to give plenty of texture detail (i.e. spreading a 4k texture over them)

Allows optimization by substituting for simpler mesh when further away.

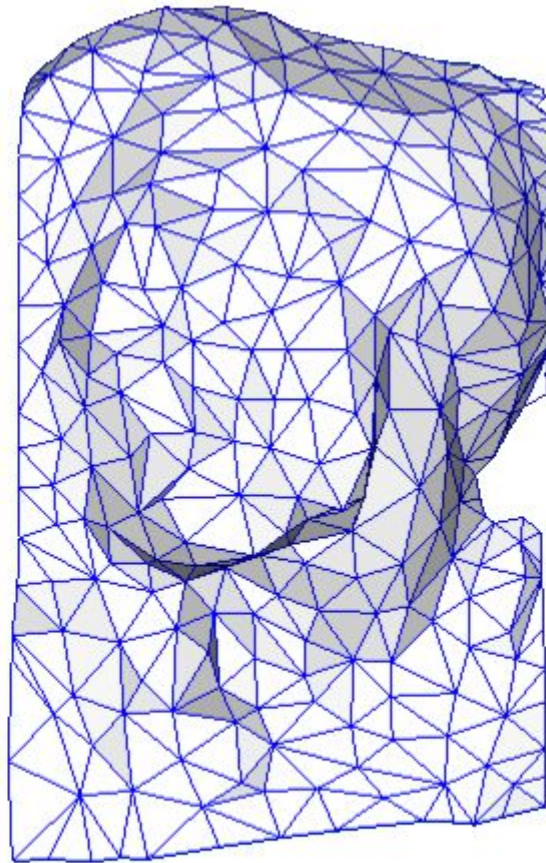
Initial stage of height + normal mapping.



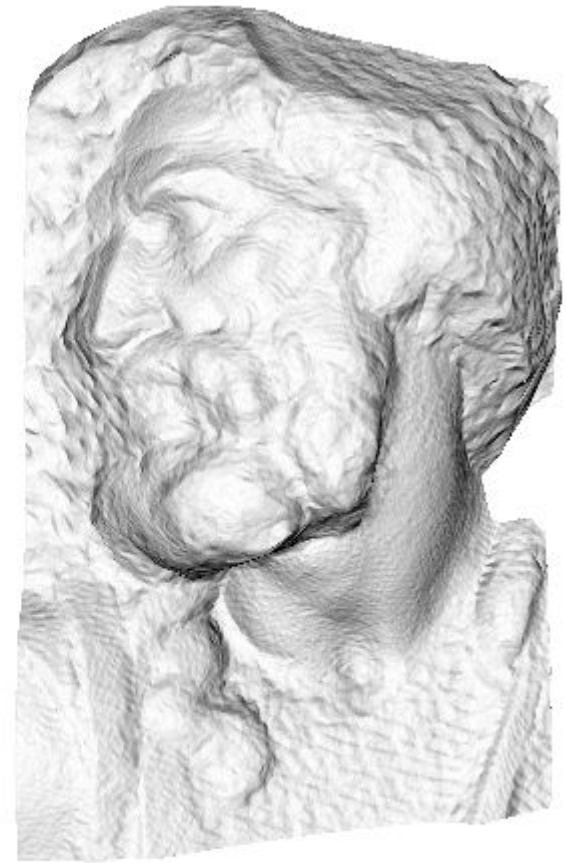
Height and Normal Mapping



original mesh
4M triangles



simplified mesh
500 triangles



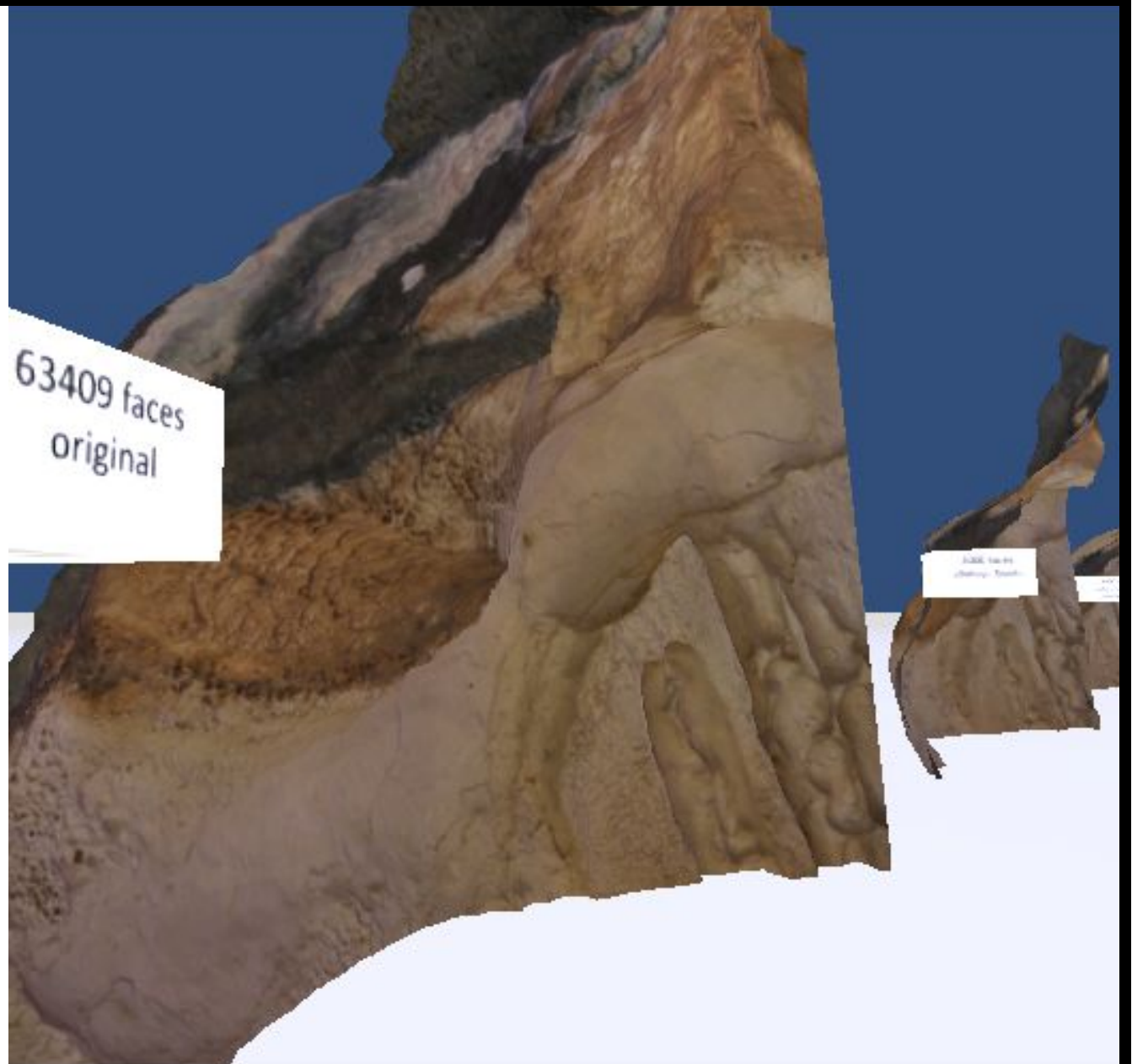
simplified mesh
and normal mapping
500 triangles

Geometry “veracity”

Attention needs to be paid to how the reduced poly-count geometry will look.

At what point is the appearance effected too much?

<rock formations>



OUTCOMES

App, tools and scripts, tour reconstruction

Viewer iPad/Android App

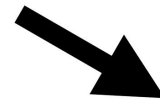
Downloads and views arbitrary model data. (No apple development or authoring needed)

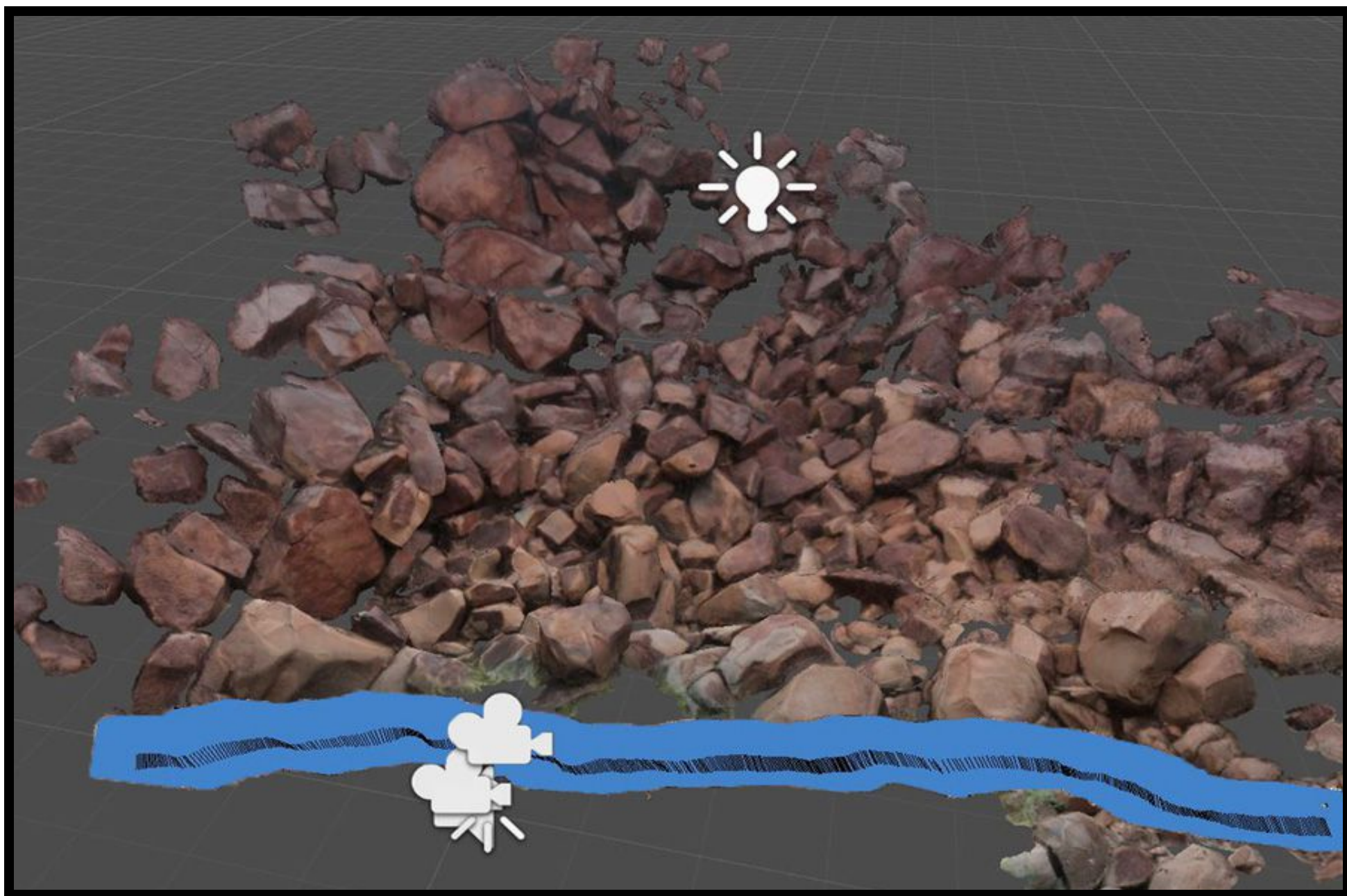


Tools and Scripts – Automate steps of processing models (3DS Max, xNormal, Unity 3D free)



cut up the models
automate texture mapping





<tour example video>

Concluding thoughts

The viewer app has huge **room for improvement**. At the moment it is just a **working prototype** for proof of concept, but I will be adding it for approval to App Store on weekend.

Workflow is not complicated, but there are a bunch of steps: still lots of room for improving the ease of the process BUT all the programs besides PhotoScan are free or free for educational use. Video tutorials should help.

The tour reconstructions from GoPro footage is a really effective way of capturing sound and motion in space without exotic equipment, **BUT** would be better to use VisualSFM for motion tracking, as it allows bracketing of frames to try to match so is much faster/linear processing time rather than exponential.

Further Research

Drone reconstruction in Burrup Peninsula.
Time-lapse comparisons in tours. <tunnel>

More info + Mailing list sign-up:
<http://tacticalspace.org/>



Projects



Updates on

App availability
videos tutorials
scripts

via mailing list.

Questions