Week 9: USD II.

**Motivation:**  
USD, do anything, anywhere! The future is here, and it’s from Pixar.

**Learning Objective:**  
Methodology of: scene layout, ascii editing, hierarchical systems  
Concepts of: layers, overrides, scope, xform, groups, parents, children

**Schedule:**

Part 1:

* USD [vertex] animation
* From the PowerPoint
  + Create a simple animated mesh in Maya
  + Explain USD “use frame” setup
  + Using a port feedback loop to save animation to a USD[A] file – this will need some detailed and patient explaining
  + Setting stage time code
  + Explore the usda file to show the differences, and explain
  + Work through the dancing group exercise
  + Defining references by file
  + Explaining and using prototypes
  + Time offsets in a layer and looping
  + Using overrides (overs) and replacing properties

**Break: 10m**

Part 2:

* Game Engine based vertex animation
  + The old way to do it (vertex animation textures)
  + The USD way and it’s differences
  + Why use USD, for fx animations, for vertex animation
  + Compression and caching in USD files
  + Unreal geocache
* Simulate, cache and export the MPM flag animation, or use the provided cache
* Use the provided loop cache node to setup a seamless loop
* Run through and explain the USD output compound, pay special attention the the port feedback compounds
* How to add a static mesh to your animated mesh without animating it
* Output gotchas and sequencer crashes

**Break: 10m**

Part 3:

* Bridging USD and Unreal
  + What works
  + What doesn’t
  + What is supported in Unreal and what isn’t
  + Building a USD scene for use in engine
  + Moving between Maya and Unreal using USD:
    - Static meshes
    - Unreal’s issue with primvar normals and how to work around it
    - Primvars and interpolation
    - UVs, textures (preview surface)
    - Vertex colour rgba
    - Animated meshes
    - Iteration loops
    - Adding FPS to the stage
    - Curves hack
    - Point instancers
    - Limitations
    - Discussing the non supported things like points, curves and lux