



Open
Subdiv

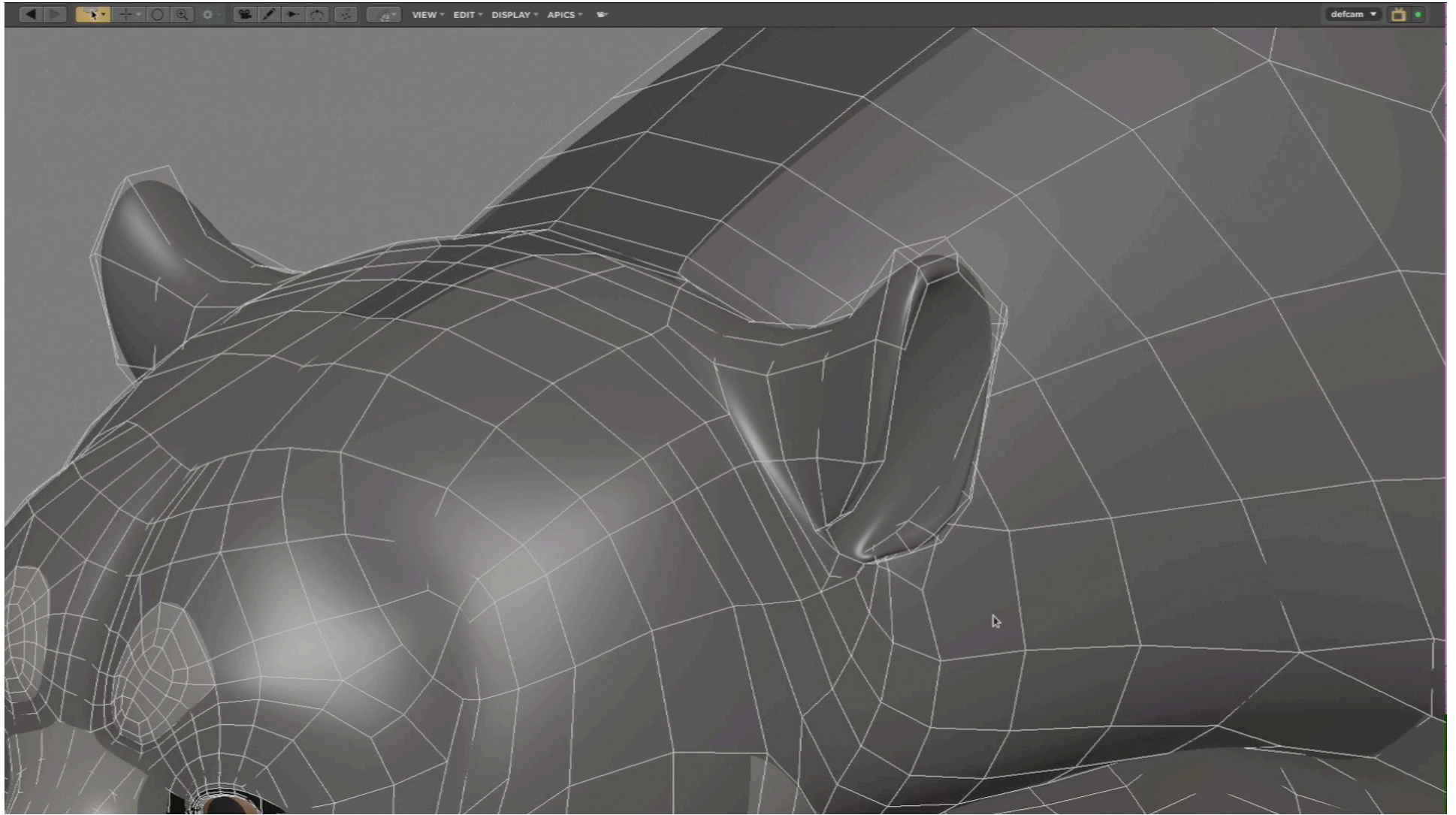
Subdivision Surfaces

Years of Experience at Pixar

- *Recursively Generated B-Spline Surfaces on Arbitrary Topological Meshes*
Ed Catmull, Jim Clark
1978 Computer-Aided Design
- *Subdivision Surfaces in Character Animation*
Tony DeRose, Michael Kass, Tien Truong
1998 SIGGRAPH Proceedings
- *Feature Adaptive GPU Rendering of Catmull-Clark Subdivision Surfaces*
Matthias Niessner, Charles Loop, Mark Meyer, Tony DeRose
2012 ACM Transactions on Graphics

Subdivision Advantages

- Flexible Mesh Topology
- Efficient Representation for Smooth Shapes
- Semi-Sharp Creases for Fine Detail and Hard Surfaces





- Open Source – Beta Available Now
- It's What We Use – Robust and Fast
- Pixar Granting License to Necessary Subdivision Patents

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Consistency

- Exactly Matches RenderMan

Internal Data Structures and Algorithms are the Same

- Full Implementation

Semi-Sharp Creases, Boundary Interpolation, Hierarchical Edits

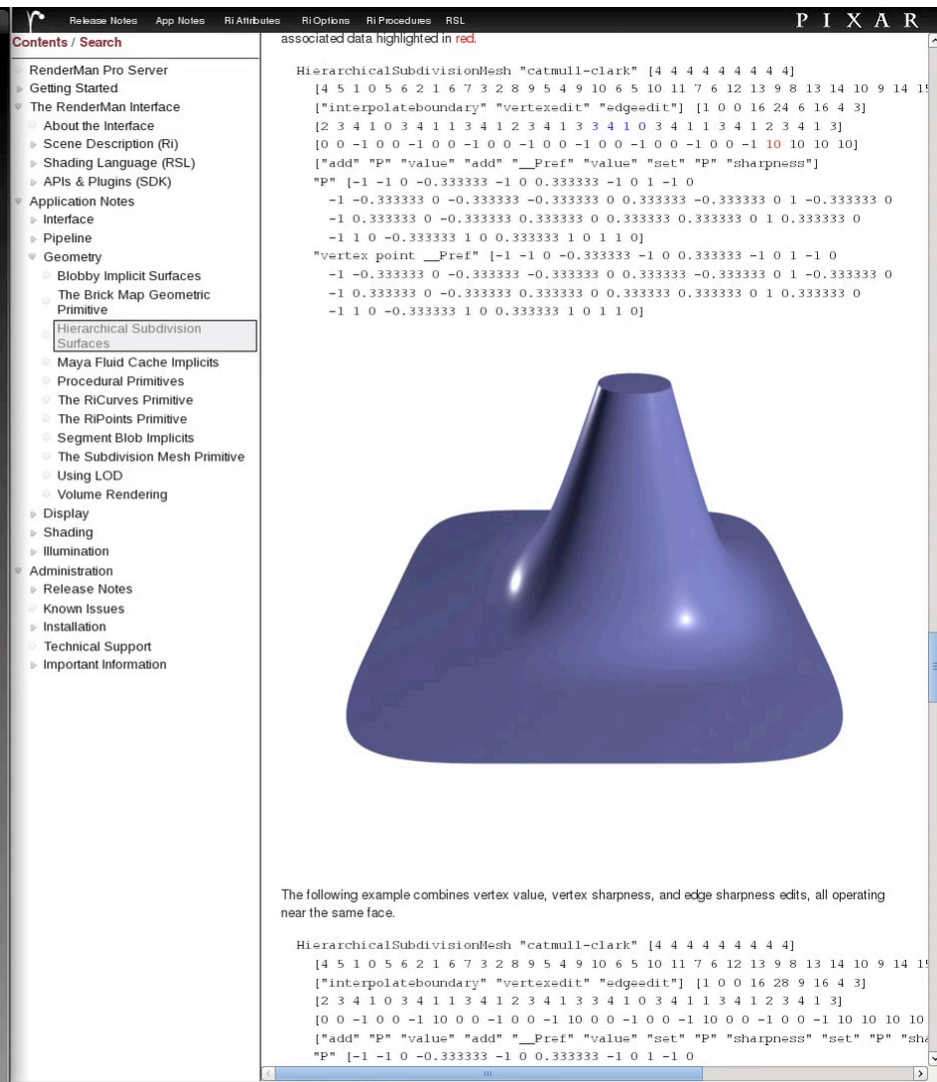
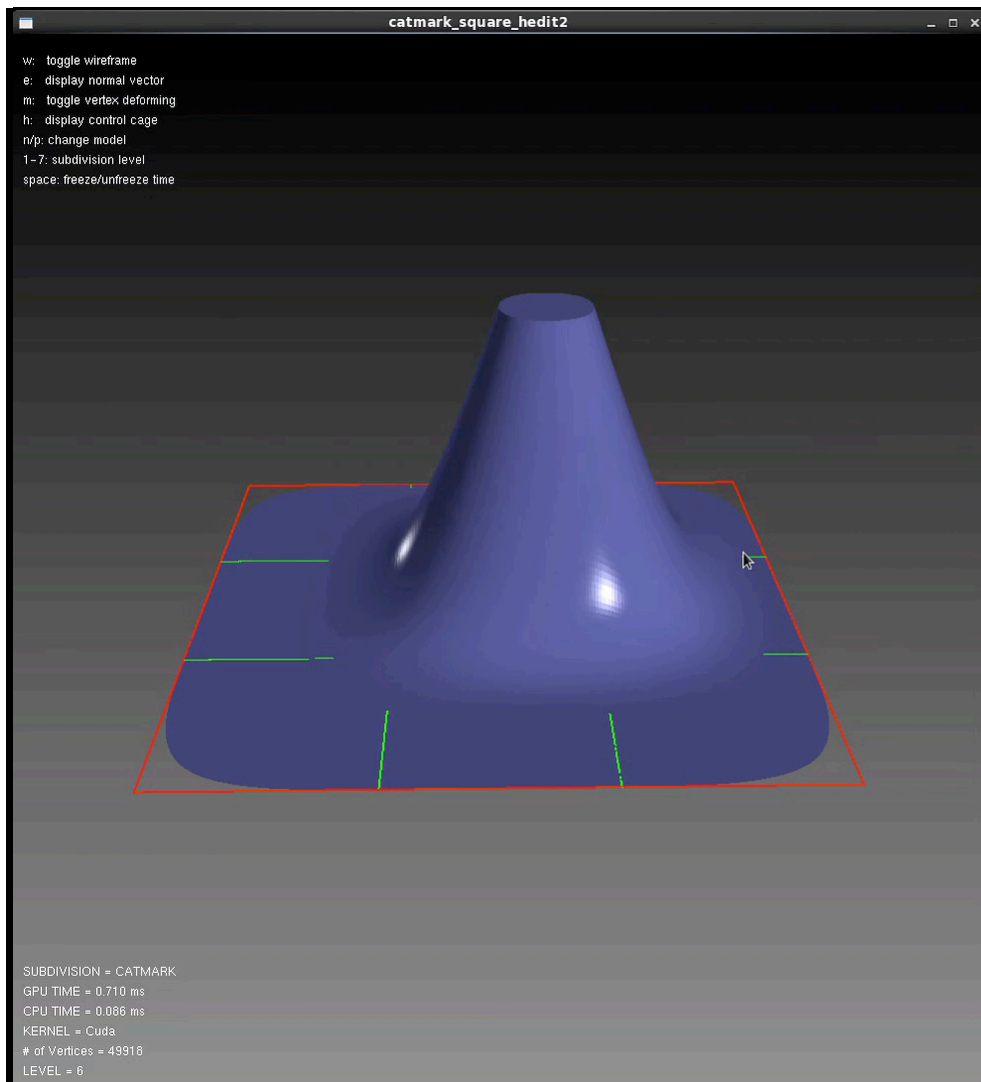
- Use OpenSubdiv for Your Projects!

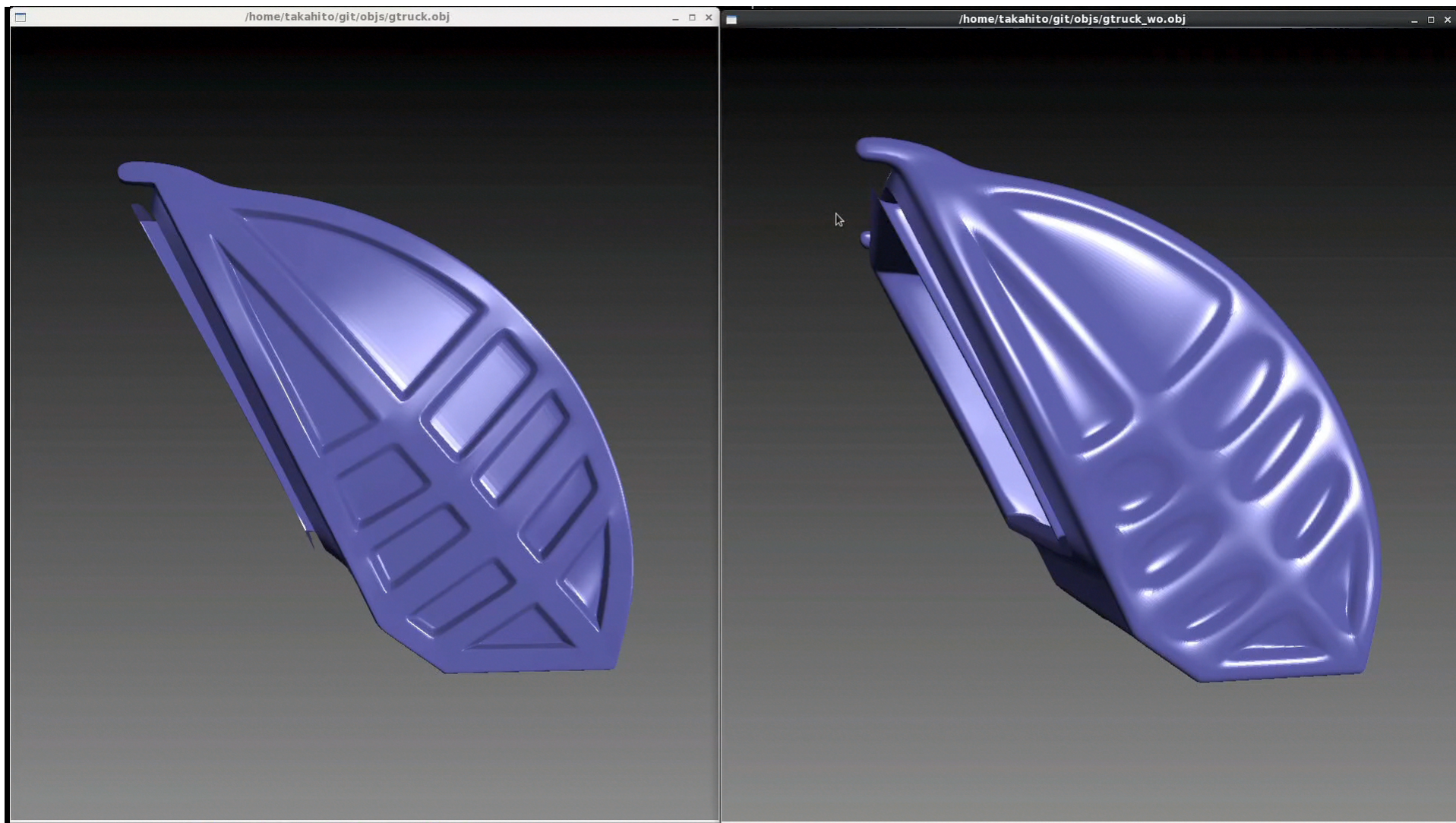
Custom and Third Party Animation, Modeling, and Painting Applications



Performance

- GPU Compute and GPU Tessellation
- CUDA, OpenCL, GLSL, OpenMP
- Linux, Windows, OS X

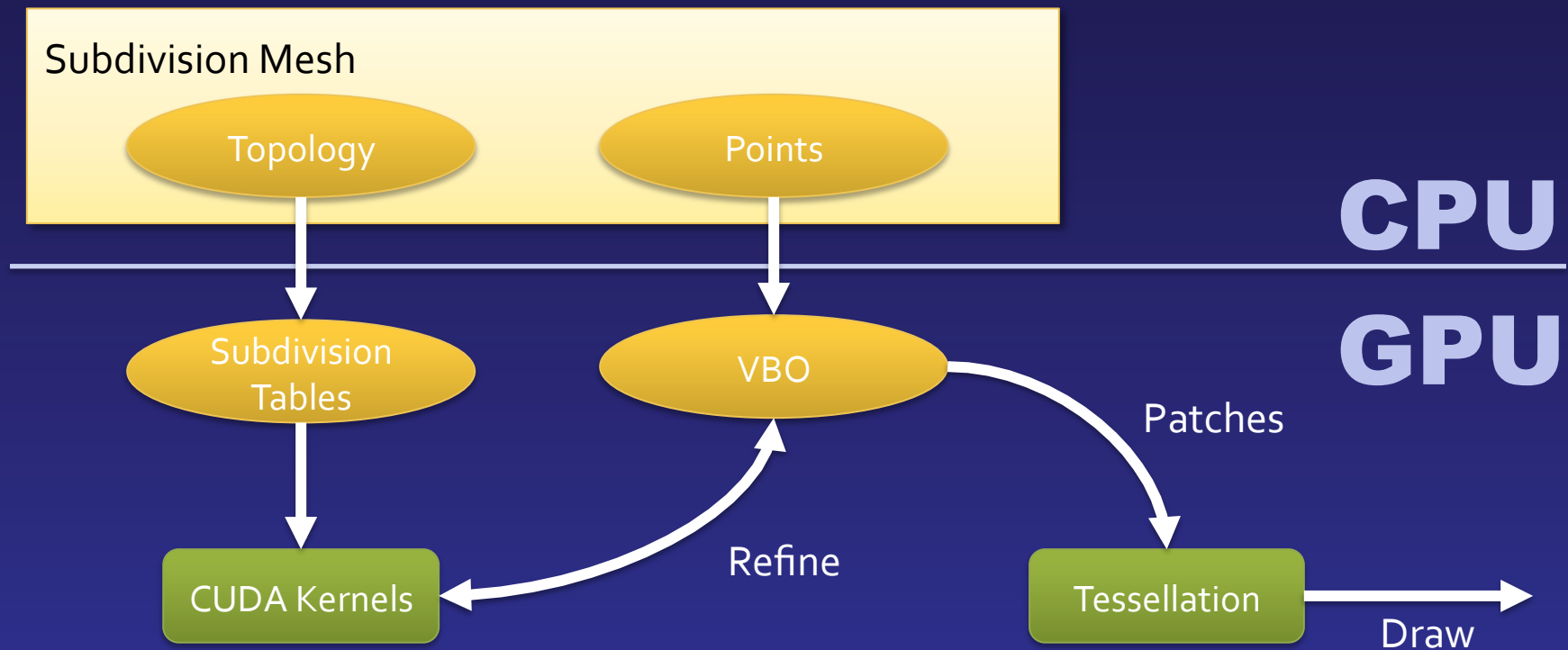




GPU Performance

- We use CUDA internally
- Best Performance on CUDA and Kepler
- NVIDIA Linux Profiling Tools

OpenSubdiv On GPU



Improved Workflows

- True Limit Surface Display
- Interactive Manipulation
- Animate While Displaying Full Surface Detail
- New Sculpt and Paint Possibilities

Sculpting & Ptex

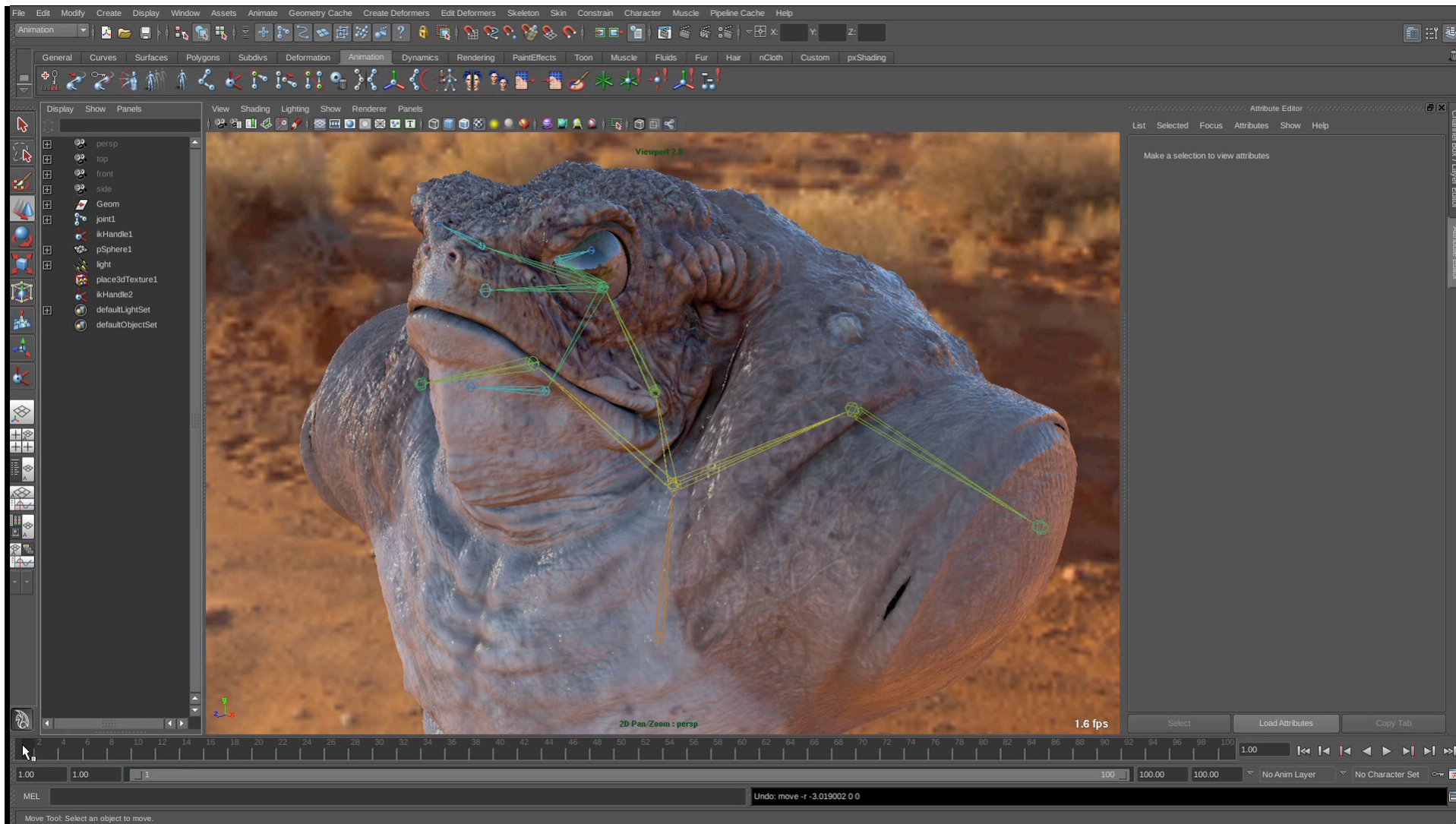
- Sculpt with Mudbox
- Export to Ptex
- Render with RenderMan





Sculpt & Animate Too !

- OpenSubdiv Supports Ptex
- OpenSubdiv Matches RenderMan
- Enables Interactive Deformation





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Feature Adaptive GPU Rendering of Catmull-Clark Subdivision Surfaces

Thursday – 2:00 pm Room 408a