

LOD



Level of Detail

Who I am

Tim Lindeberg

Took this course 2 years ago

Currently doing my masters thesis on dynamic level of detail using eye tracking

What I will be talking about

Level of detail in general

Dynamic level of detail

Tessellation

Foveated rendering

Level of Detail (LOD)

A way of increasing the performance of real time 3D graphics applications

Used in almost all games

Comes in many varieties

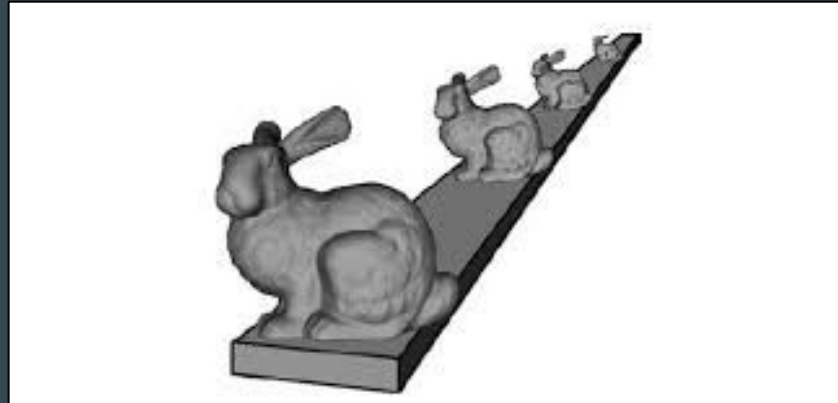
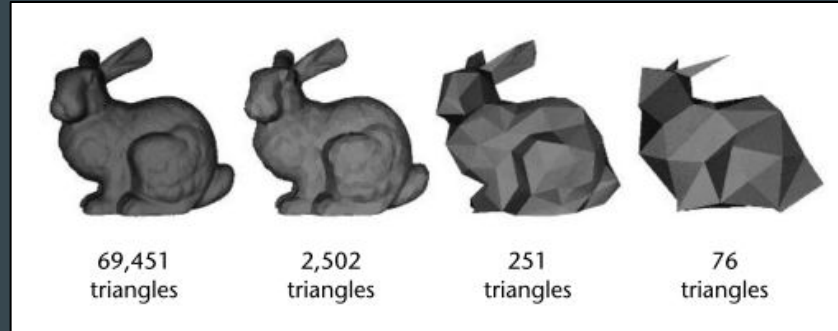
Discrete Level of Detail

The most common method

Predetermined levels of detail

Version is selected based on some metric, usually distance to camera

Discrete Level of Detail



Dynamic LOD

Many different methods

Continuous LOD

Removes popping artifacts

Greater overhead

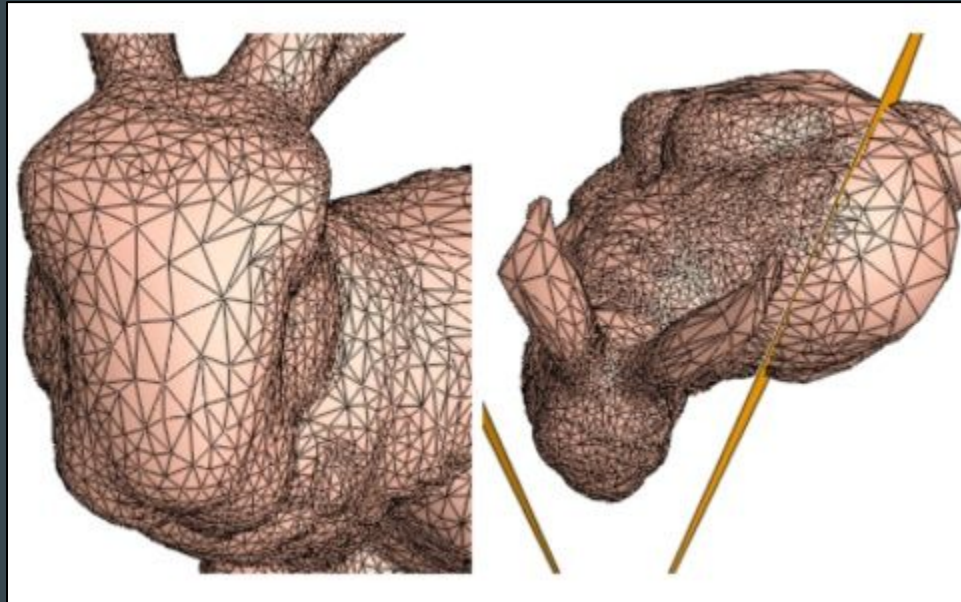
Dynamic LOD

View-dependant LOD

Even more advanced and costly

Can increase performance

Dynamic LOD



Billboards

Discrete LOD:ing taken to the extreme

Replaces mesh with a single quad

Pre rendered sprite from multiple angles

Tessellation

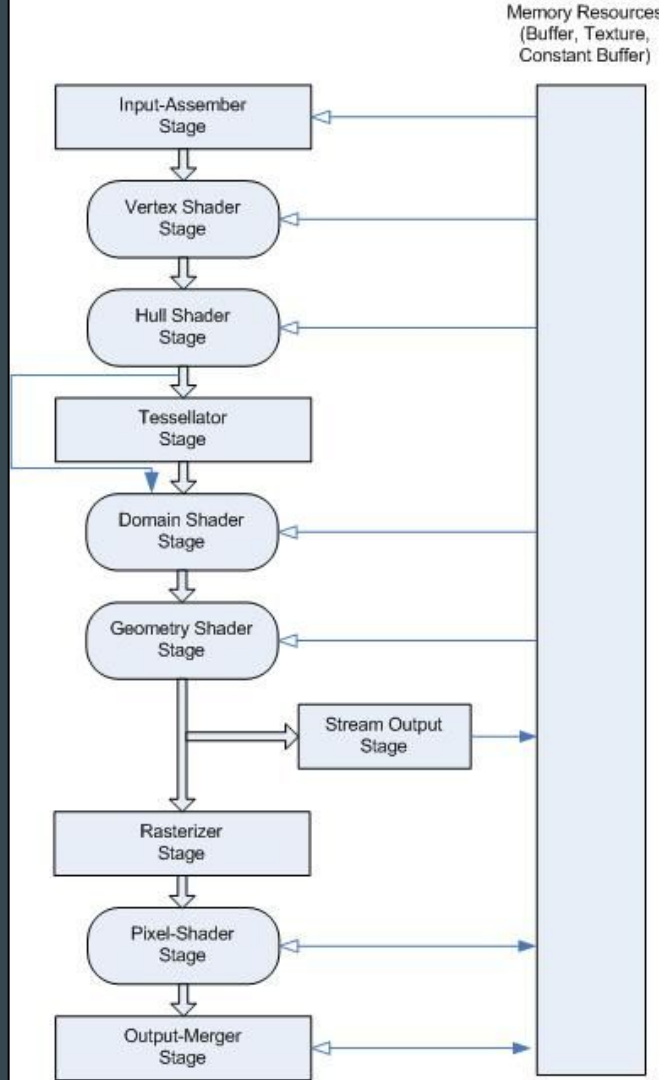
Modern technique, introduced in DirectX11

Starting to see adaptation in modern games

Generates geometry dynamically on the GPU

Tessellation

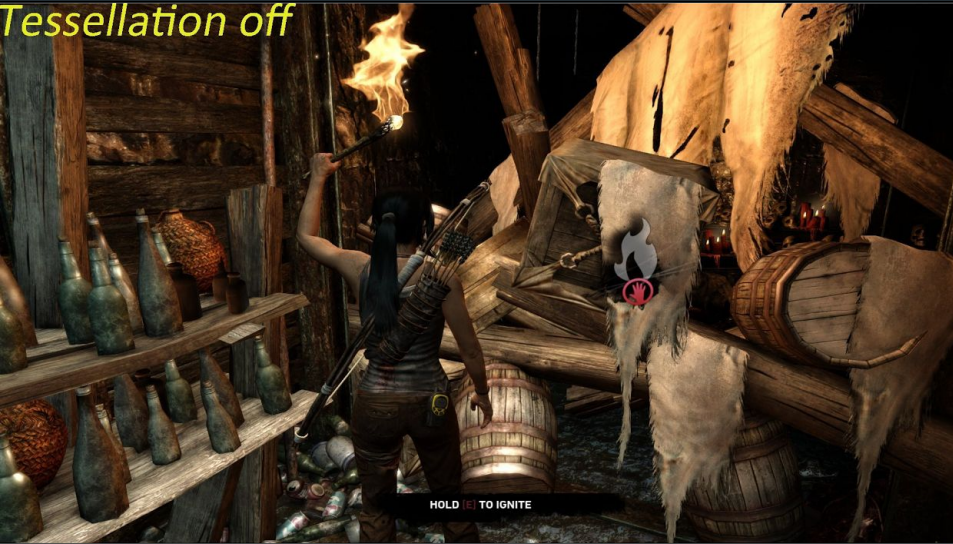
The shader pipeline



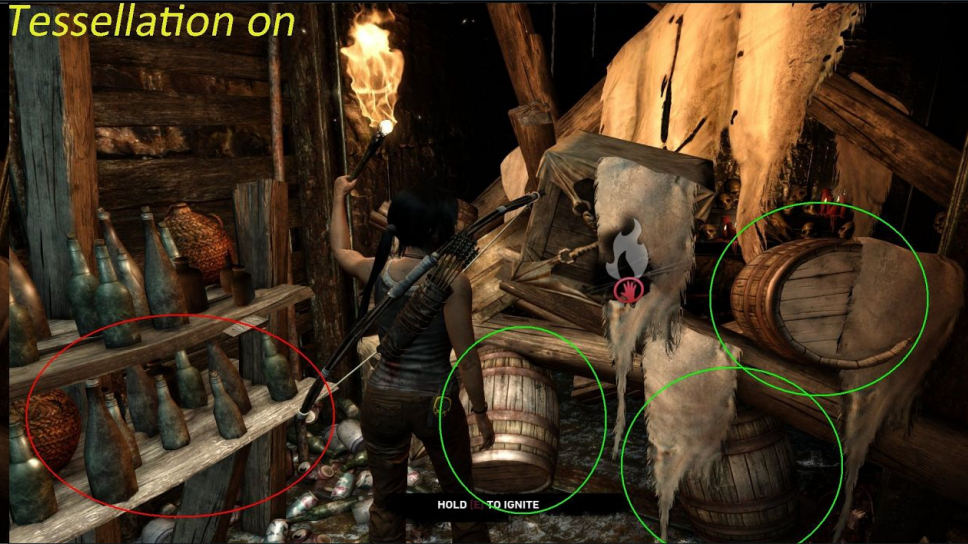
Tessellation

Smoothing of objects

Tessellation off



Tessellation on

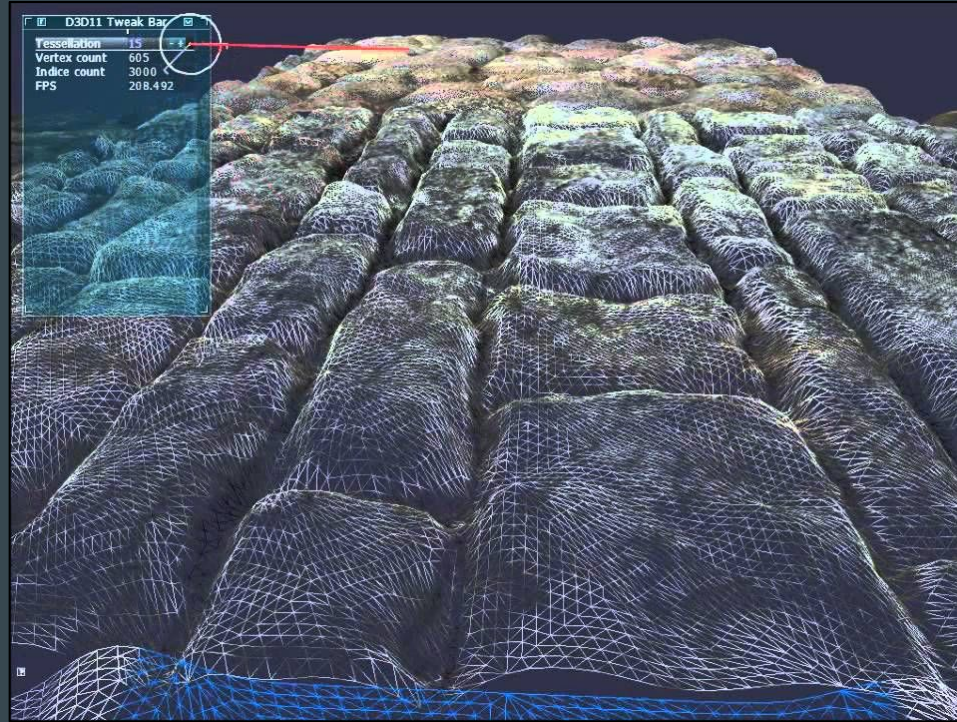


Tessellation

Displacement maps

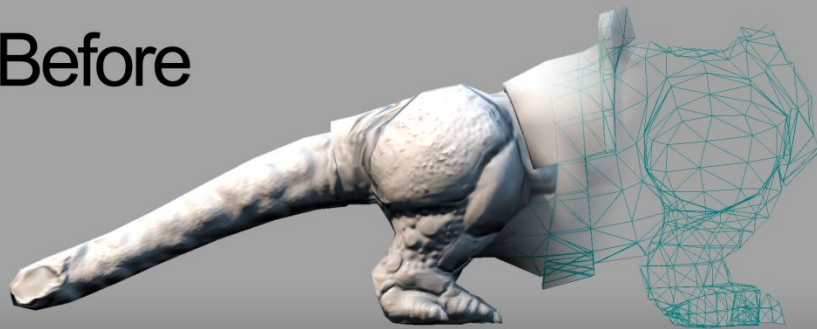


Tessellation

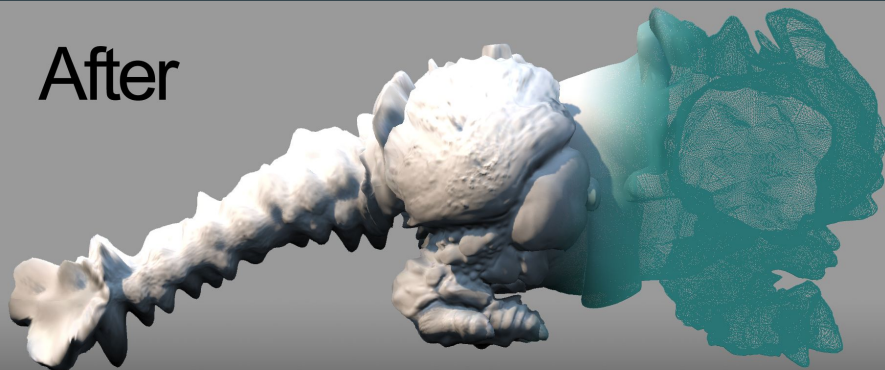


Tessellation

Before



After



Foveated Rendering

Using LOD schemes with eye tracking

Can be combined with all the previously mentioned techniques

Needs extremely fast eye tracking

Foveated Rendering

Multi-resolution foveated rendering

<https://www.youtube.com/watch?v=GKR8tM28NnQ>

Questions?