

Optimisation

Fog

Billboards

Level of Detail (LOD)

Batching

Fog Motivation

- Fog increases realism and declutters a scene
- Fog also obscures distant shapes, hiding the far clipping plane
 - `Camera.setFrustumFar(float frustumFar)`
- jME provides a fog post processing filter

FogFilter

- Extends `com.jme3.post.Filter`
- A 2D effect applied to the rendered scene
- FogFilter has:
 - A color
 - A fog density
 - A fog distance

FogFilter

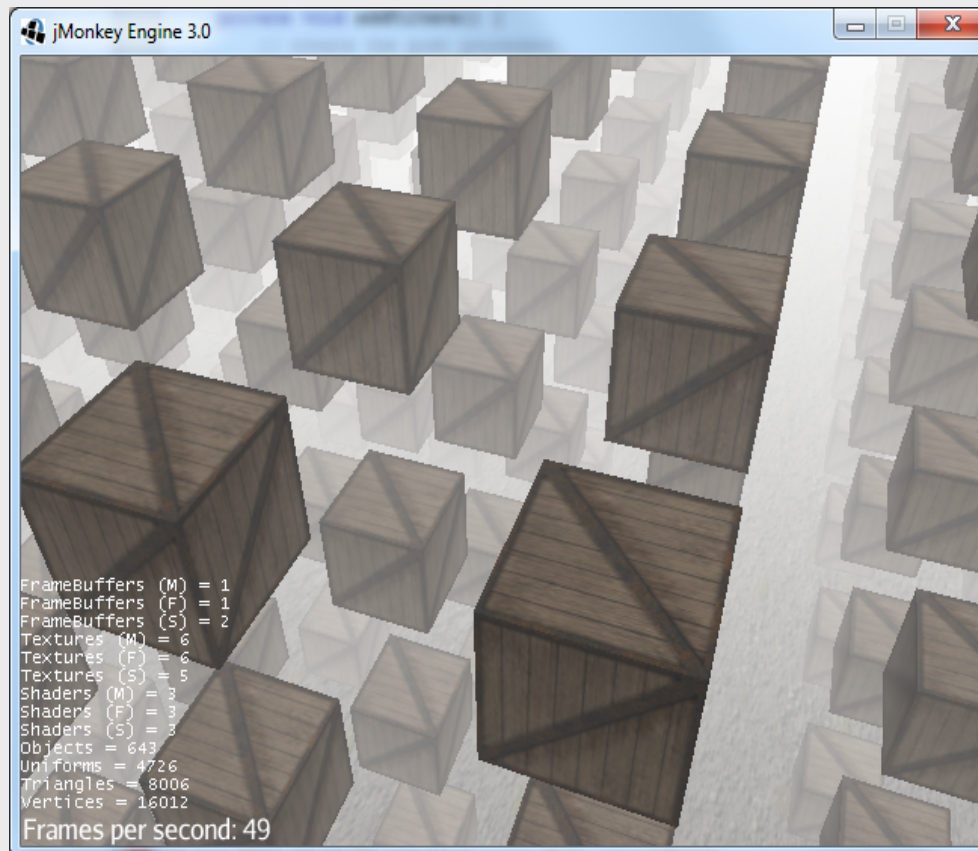
- An exponential function is used to calculate thickness
- Higher density creates thicker fog
- Distance controls how far the fog reaches

FogFilter

- Create fog

```
FogFilter fog = new FogFilter();
fog.setFogColor(new ColorRGBA(1f, 1f, 1f, 1f));
fog.setFogDensity(2.0f);
fog.setFogDistance(100.0f);
FilterPostProcessor fpp = new
    FilterPostProcessor(assetManager);
fpp.addFilter(fog);
viewport.addProcessor(fpp);
```

FogFilter Example

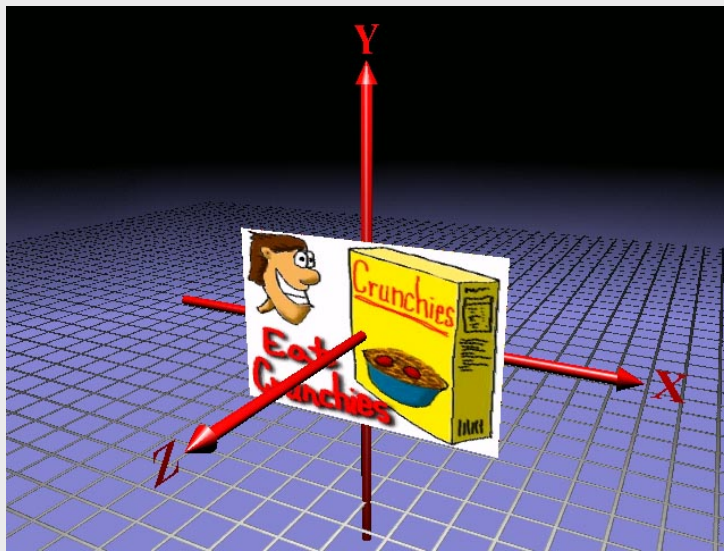


BillboardControl

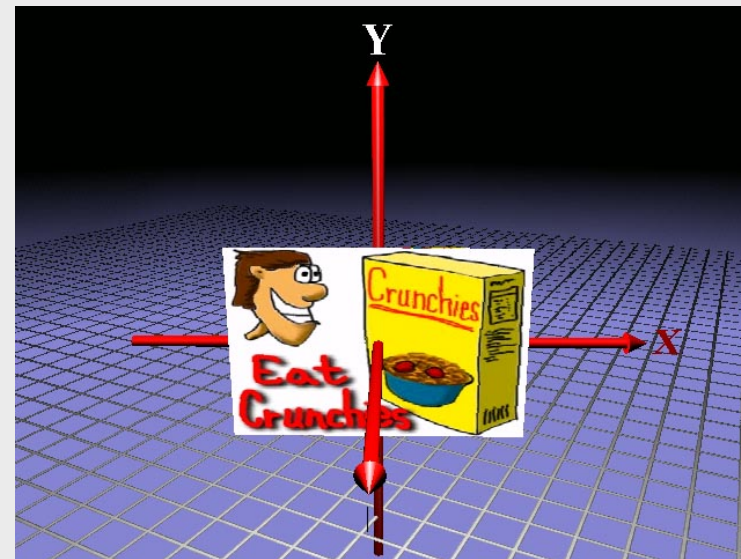
- BillboardControl is a control that:
 - Tracks the camera
 - Generates a rotation so that the object is facing the camera or screen
 - Writes that transform to its Spatial

BillboardControl

Viewer steps to the right . . .



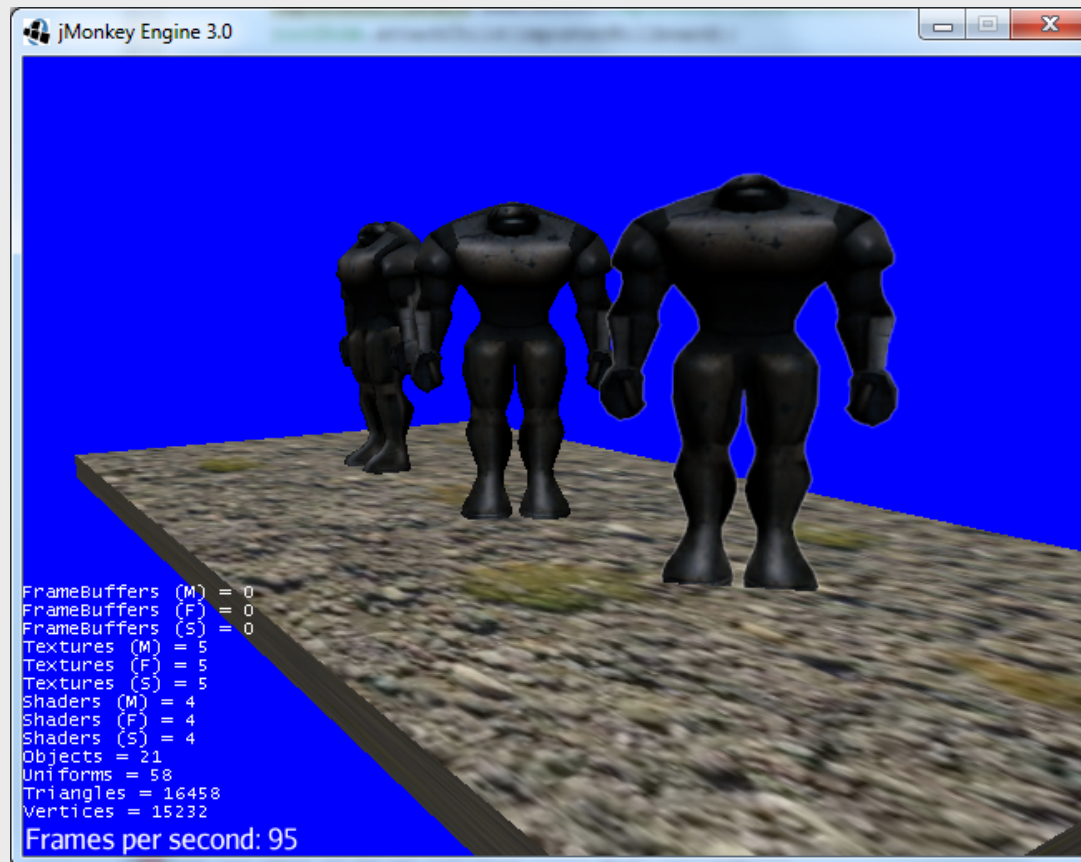
. . . and the control immediately rotates the spatial



BillboardControl.Alignment modes

- Determines how the billboard is aligned to the screen or camera
- *AxialY* aligns to the camera, but keeps the local Y axis fixed.
- *AxialZ* aligns to the camera, but keeps the local Z axis fixed.
- *Camera* aligns to the camera position
- *Screen* aligns to the screen

BillboardControl example



Level of detail

- jME supports level of detail in its core
- Mesh can have LOD index buffers
 - `void setLodLevels(VertexBuffer[] lodLevels)`
 - `int getNumLodLevels()`
 - `VertexBuffer getLodLevel(int lod)`
- Is used instead of the mesh index buffer if set

Level of detail

- Spatial has method to set which LOD to use
 - void setLodLevel(int lod)
 - Node propagates to children
 - Geometry stores the lod level

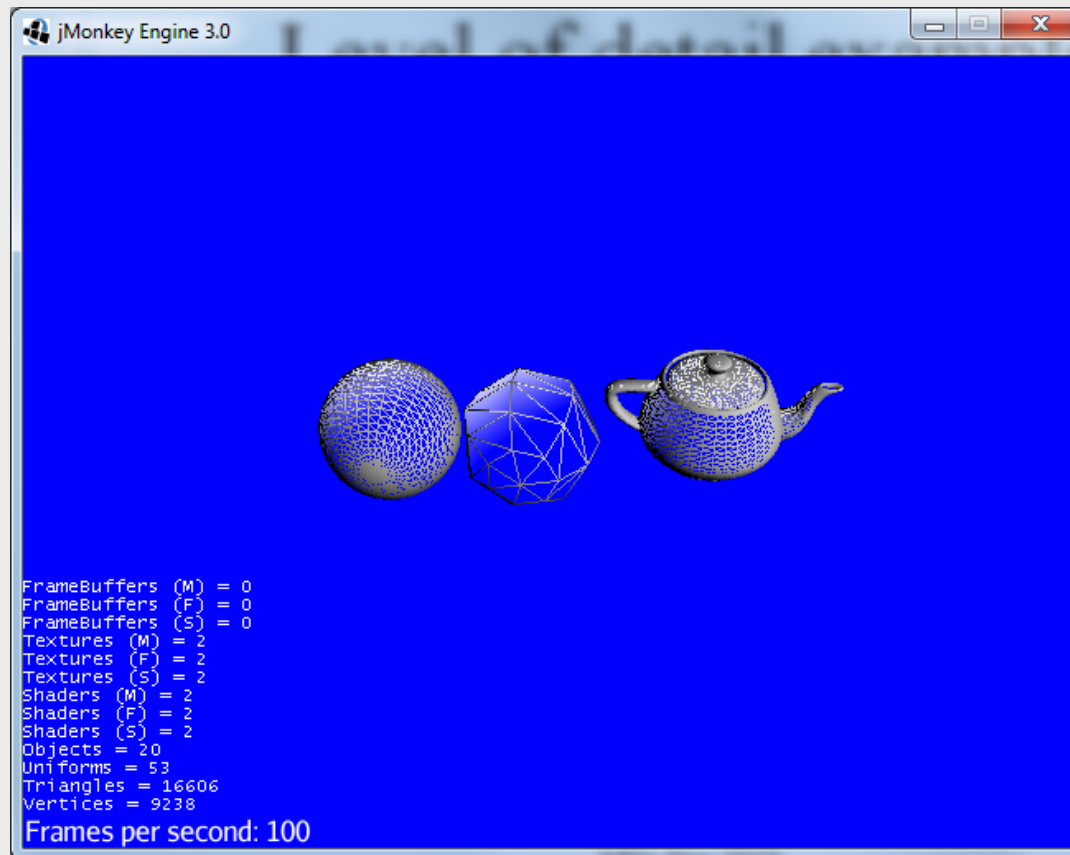
LodControl

- Determines what level of detail a Geometry should be
- Based on how many pixels on the screen the Geometry is taking up
 - `get/setTrisPerPixel`
- `BoundingBox` used to calculate screen coverage
- Geometry must move atleast the distance tolerance relative to the camera before switching to a new LOD
 - `get/setDistTolerance`
- Can only be added to geometries

MeshLodControl

- Not part of jME but part of the course material
- Allows switching between meshes instead of index buffers
- Still have to use the same material

Level of detail example



BatchNode

- Geometries in sub scenegraph is combined
- Holds one geometry per material
- Must call batch() after changing subgraph
- Less draw calls
 - Graphic cards good at processing larg chunks of data
- Culled as one
 - Can degrade performance

BatchNode example

