

3D Scene Guidance Notes

Aim

This document aims to give a **guide** to the key properties of a suitable 3D scene to be used in creating an interactive 3D application.

This document should be reviewed by someone familiar with 3D imaging software.

Definitions

3D Scene: The main environment. This does not include items.

Object: All objects on screen, including items and the 3D scene (i.e. A chair and a wall are both objects)

Items: Objects which are separate from the 3D Scene (a chair is an item, but a wall isn't as it is part of the 3D scene)

Application: The 3D scene including items and functionality

Free Evaluation

Please submit your 3D scene to MOOFU for a **free evaluation**.

Please submit the 3D scene as a **3ds file** and include the **source file**

To submit a 3D scene, please contact us at:

info@archi-me.co.uk - 0845 6431519

Key Guidelines for 3D Scene

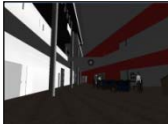

- Less than 60,000 tris recommended
- Less than 500 objects recommended
- Doors should be kept as separate objects
- Geometry should be bug free

Please note that these limits are intended as guidance only. The difficulty in setting strict limits is explained below. As a result of this difficulty, we ask clients to submit 3D scenes for a **free evaluation**.

The Difficulty in Setting Limits

MOOFU aims for real time rendering of 3D scenes in a web browser, meaning that the **onscreen polygon count is a crucial figure**.

These limits have been calculated based on a large open plan school. As it is the onscreen polygon count which is crucial, it is possible to have a building with more restricted views that would have a higher total polycount while still achieving the crucial on screen figure. This is because in an open plan building, it is possible to view a large proportion of the building from a single view point. This results in a higher on screen polygon count. However, in a building where the view is restricted, less of the building can be viewed at once, meaning the total polygon count can be higher.

	Building Type	On Screen Polygon Count	Total Polygon Count
Open Plan	 Large proportion of 3D scene visible at once	60,000 tris	Can exceed 60,000 tris by only a small amount
Restricted Views	 Small proportion of 3D scene visible at once	60,000 tris	Potentially a lot higher than 60,000 tris

Ideally a 3D scene should be around 500 objects with a polygon count of around 60,000 tris, with a possibility to increase these limits with the size of the 3D scene. Import limits make 3D scenes over 1000 objects unstable, but this can be remedied by attaching objects together in Max and this task can be completed by MOOFU if necessary.

The information on the following pages provides greater detail on how these limits were established.



Importing from 3D Studio Max

Our 3D software currently imports the following settings from 3D Studio Max:

- All nodes with position, rotation and scale. Pivot points and names are also imported
- Meshes with vertex colours, normals and one or two UV sets
- Materials with diffuse texture and colour. Multiple materials per mesh
- Animations
- Bone based animations

Target Machine

- 1.6 ghz Processor
- 1 Gig of RAM
- Integrated Graphics Processor

Current applications target a 1.6 ghz PC, 1 gig of RAM and integrated graphics. This is an example of the lowest end of target machines. It will be acceptable to achieve 30 - 60 fps on the target machine. To reach this, limits must be set not only on the polygon count, but also the object count.

The polygon count is the sum of all visible objects polygons on screen. The object count is the number of groups of polygons on screen.



Polygon Limits

To calculate a polygon count a series of objects were created and grouped, before using the target machine to establish the fps. All polygons have a diffuse material, collision data and share a dynamic light. All objects are visible and rendered at “Good” quality at a resolution of 800x600 pixels.

Total Polygon Count	Total Object Count	Frames Per Second
3968	1	60
15872	4	50
31744	8	42
63488	16	29

Based on these figures, it was concluded that around 31744 polygons can be rendered at one time.

Object Limits

Please only attempt to group objects if the 3D scene exceeds the limit of 500 objects. In the event that objects do have to be grouped, please group objects by proximity and by object type. For example, if the 3D scene featured two rooms with five windows each, MOOFU would advise creating a group of windows for each room. This would result in a lower object count.



Lighting

Methods of lighting items or 3D scenes by baking textures using the 'render to texture' functionality in 3dsMax and other 3D software have been investigated. Although this does result in nicer looking graphics, it vastly increases the storage size and memory requirements of the software. With character and item meshes, simply using a smooth modifier is sufficient and desirable.

Textures

- Diffuse Texture
- Possibility for Shaders to be added by MOOFU

Max files should use textures for all materials in the form of diffuse textures. Certain objects can have shaders attached by MOOFU, such as windows, but generally in the max file only diffuse textures should be applied.