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Loading an External 3D Model

Computer Graphics 2021

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Let's get rid of the boring cubes!

In real applications the rendered models are complex models, usually represented as 3D triangular meshes with material properties:

- Texture (+uv mapping)
- Diffuse color
- Specular color

Load meshes from external files

Different file formats to represent meshes:

- OFF
- PLY
- STL
- …

How to load them in our javascript code?

- Create a parser for each type of file
  - Not feasible in this course
- Use an external tool to convert them into an easily readable JSON file
- Use an external library to load .obj files

OBJ files pt1

```
o pig_mechanic_ID240.026b //header with file name
v -0.272493 -0.042941 0.082401 //vertex positions
[...]
vt 0.042342 0.478492 //vertex uv coordinates
[...]
vn 0.1737 0.9398 -0.2943 //vertex normals
[...]
f 916/916/916 914/914/914 996/996/996 //faces in the format vertexIndex/uvIndex/normalsIndex for the
[...]                                  three vertices composing them
```

We load .obj files with the library webgl-obj-loader.min.js

In the html file add:

```
<script type="text/javascript" src="webgl-obj-loader.min.js"></script>
```

OBJ files pt2

- In the javascript file:

```
//This line must be in an async function
var objStr = await utils.get_objstr(pathToModel);
var objModel = new OBJ.Mesh(objStr);

var modelVertices = objModel.vertices; //Array of vertices
var modelNormals = objModel.normals; //Array of normals
var modelIndices = objModel.indices; //Array of indices
var modelTexCoords = objModel.textures; //Array of uv coordinates
```