PrMan 3D Printing

3D “really” renders using RenderMan

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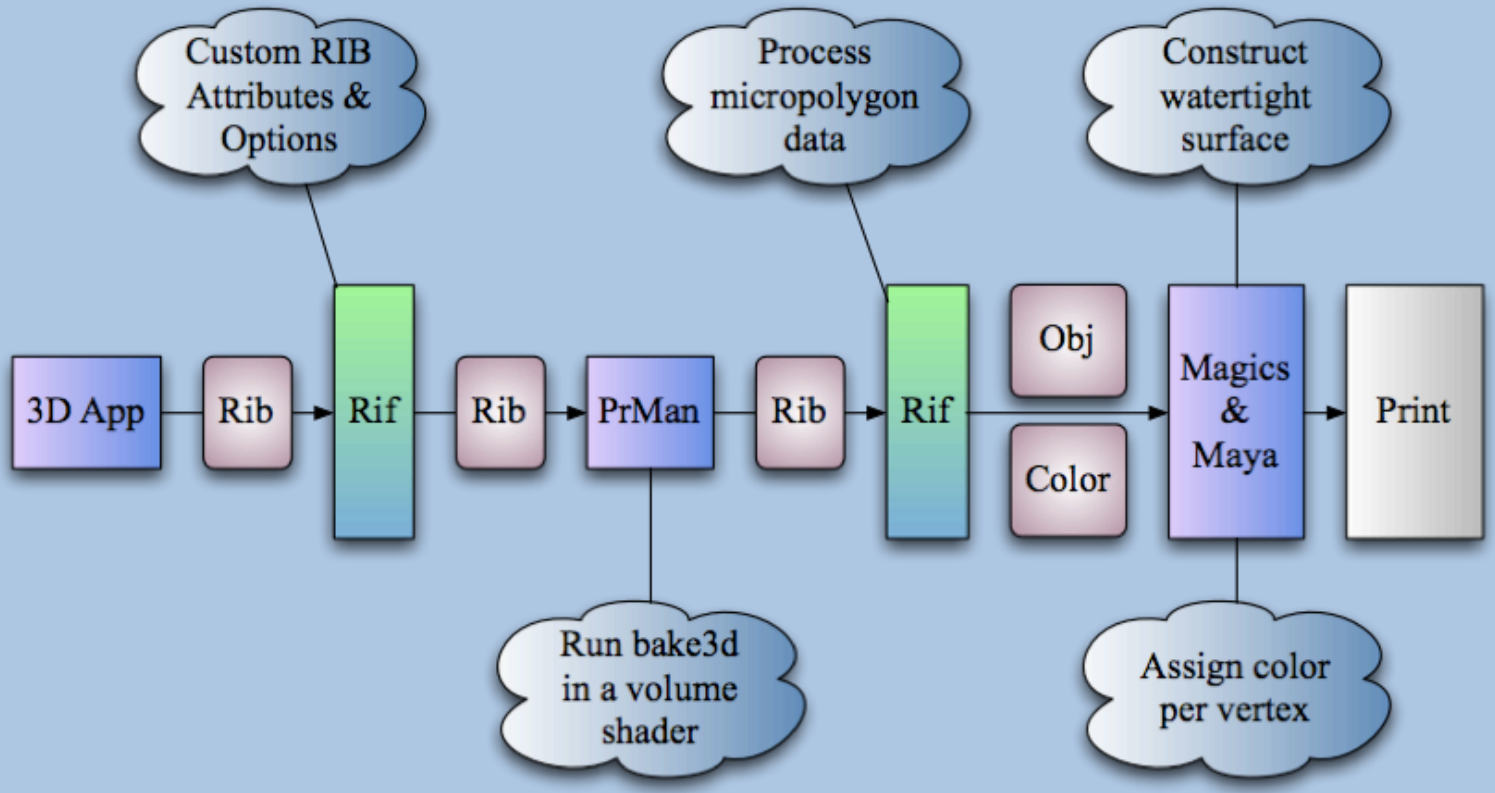
Goals

- Produce 3D data from a posed character
- Support all our characters (i.e. Woody)
- Retain color and displacement
- Minimize fixes to geometry & shaders
- Exploit ZCorp 3D color printing

The Pipeline



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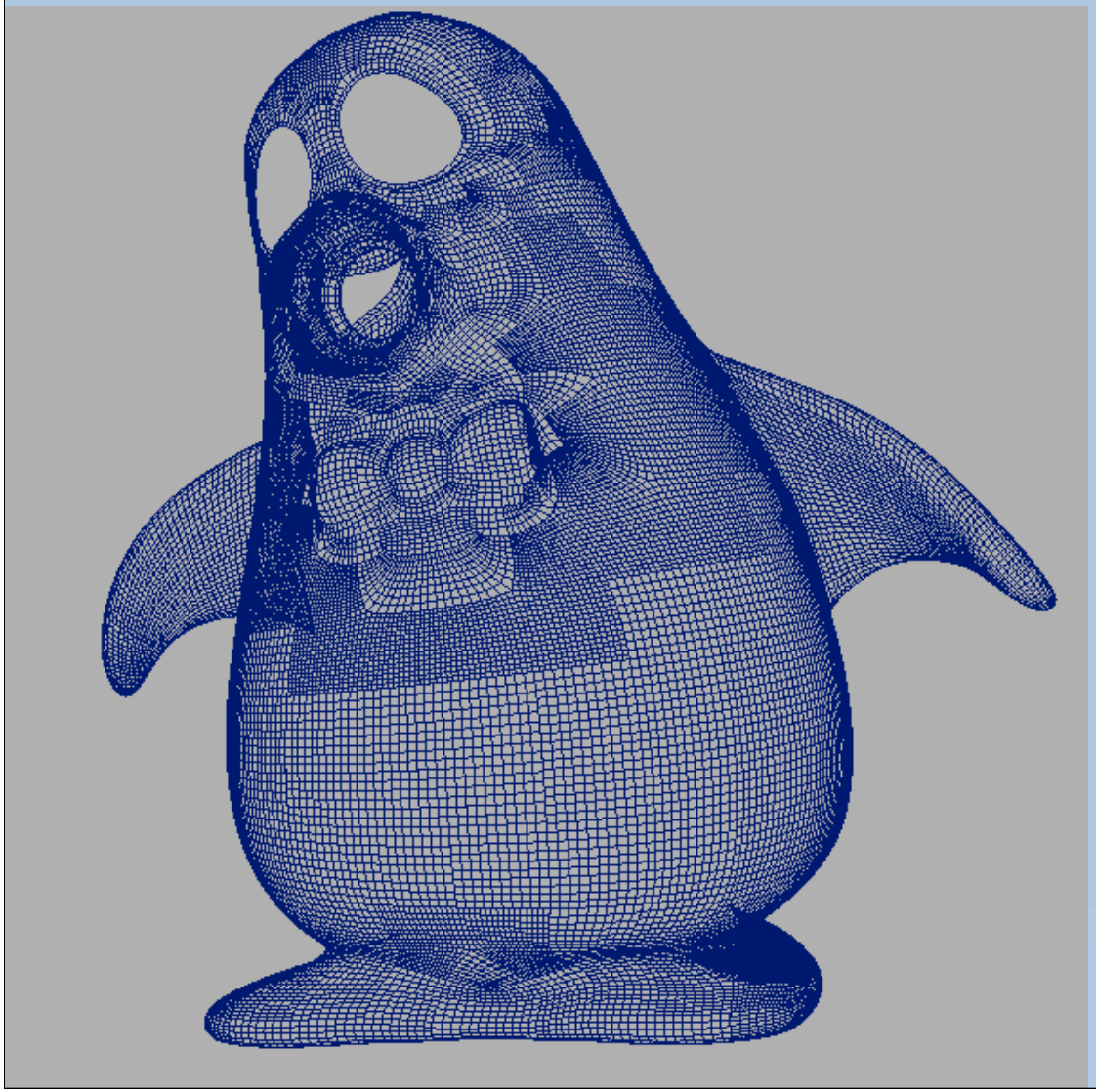
The “fancy” Shader

```
atmosphere baker()
{
    normal Nn = normalize(calculatenormal(P));
    float GPIdx=-1;
    attribute("user:GPrimCounter",GPIdx);
    string filename = "FOO";
    option("user:bakeribfilename",filename);
    bake3d(filename, "Ci,GPrimID", P, Nn, "Ci", Ci, "GPrimID", GPIdx);
}
```

Micropolygons



- Micropolygons for single sided/ shaded subdivision surface
- Tessellation controlled with ShadingRate or image resolution
- Everything is generated except trimmed NURBS surfaces at trim boundaries

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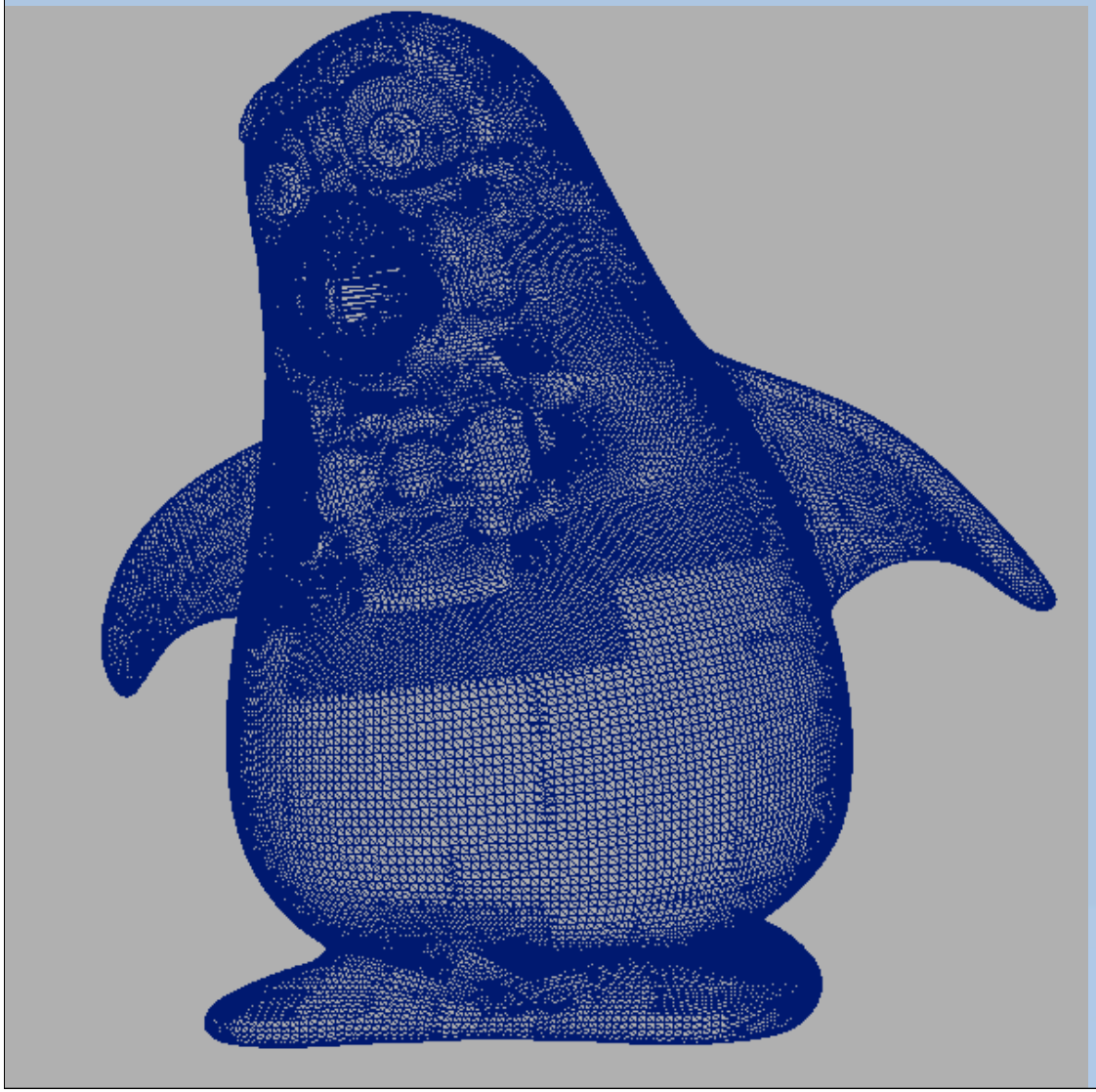
Watertight surface



- Micropolygons are stitched and triangulates
- Multiple surfaces are converted into a single closed polygonal mesh
- We use Magics from Materialise on Windows to prepare a PLY file for the ZCorp

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Color per vertex

- Maya plugin to apply color per vertex on the “printable” mesh
- Possible color tweaks and fixes using Artisan in Maya
- Precision issues still “under investigation...”

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ZCorp 3D Printer

- 3D prints can take from several hours depending on the model
- Extremely fragile
- “Cooking” for 6-12 hours in the oven is recommended
- Multiple coats of strengthening material applied by hand

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Thanks

- Wayne Wooten & Julian Fong (PrMan R&D)
- Mike Krummhoefener (Digital Sculpt & Paint)
- Warren Trezevant (Animation Poses)