Tottes take on Bump-, Displacement- and Normal maps

Let's not waste any time and jump straight in.



Fist I modeled a tile like this. I modeled it in Chetah3D just because I'm most familiar with it and it has some nifty features for exporting UV-templates, as PDF.

I fixed the UV mapping and this is the UV-template, very simple indeed.





I then used Photoshop to generate a basic texture. I first generated a simple concrete texture using FilterForge, then another one in a new layer, removed most of it and blurred it to get some nice detailing on the edges, nothing fancy, but I wanted a good enough texture for my upcoming experiments.



I imported the object into DAZ Studio, then applied the texture map as diffuse and corrected some basic settings, but that's not why we are here today so I skip that. I added Simply Lit UE2 light to get good renders for my test, using shading rate 0.2 for a reasonable speed. This is a plain render, nothing else but the diffuse.



This is using a bump map only. The bump and later normal maps used are on purpose not generated to match the used texture.

This is using a bump map and the same map driven into the displacement too. Render time is significally longer using displacement maps.





This is using a bump map, and a modified version of the bump map driven into the displacement. Displacement maps should have less differences in the greyscale.





This is using a normal map, and a modified version of the bump map driven into the displacement. Displacement maps should have less differences in the greyscale. Rendering using normal maps is significantly faster than using displacement maps.

Rendering with Normal map, 13 seconds. Rendering with Displacement + Bumpmap 1 min 46 seconds.





For this test I just generated another Normal map and used it to see the difference.





And for the last one, I quickly tossed up a Filter to make a Normal map that would fit the diffuse map and how it is layer out on the mesh.

So, what is my conclusions here? I was using DAZ Studio 4.6 so the mesurements are only valid for that, but Displacement maps render about 8 times slower than Normal maps.