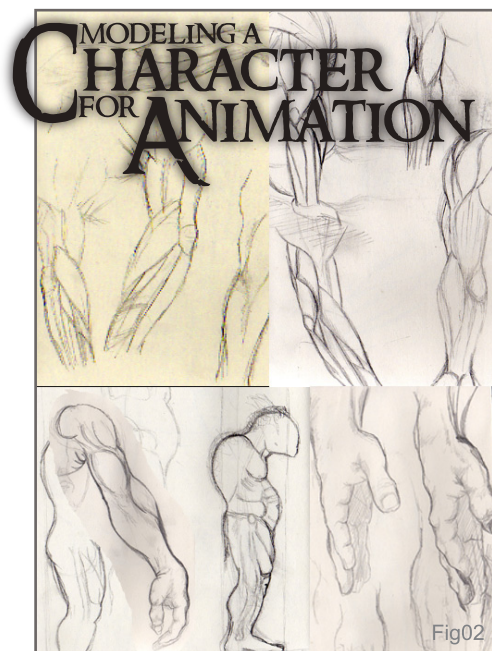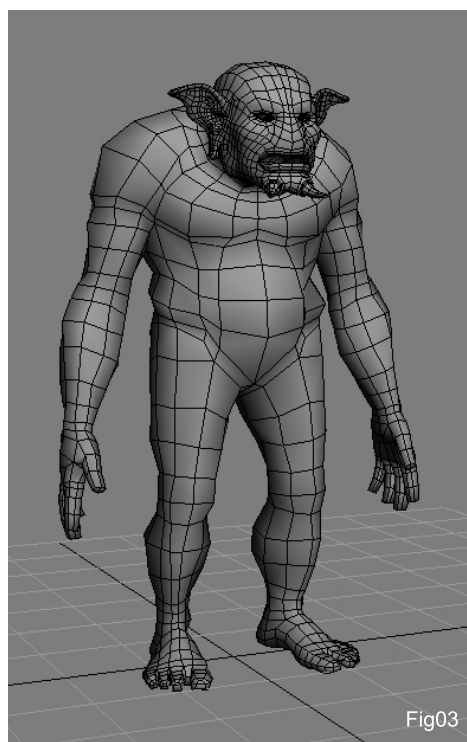# Modeling a Character for Animation

Using the latest methods, and a little help from 3DS Max and Z-Brush, see how Nicolas Collings created his highly detailed 'Trarch'...

MODELING A CHARACTER FOR ANIMATION

Fig02

In this article, I'd like to present the making of my new character, 'Trarch'. The workflow used to create this character is an up-to-date creative process. That is to say that the modelling phase will use digital sculpting software (Z-Brush), and afterwards I'll work in 3DS Max to retopologize the sculpted model and create a friendly animation mesh. So let's begin…

Fig03

Fig01

REFERENCE

The first phase consists of finding a design for the character. I decided to choose a concept created by concept designer Miles Teves (Fig.01). **Beware:** Don't forget to ask authors for their permission. Once the concept is chosen, I can begin to draw some sketches on paper to have a more precise idea of the model (Fig.02). This step is really important for me; it allows me to feel more confident when starting to model, because I have already thought about the way things need to be created (anatomy, muscles position, etc.).

LOWPOLY (Fig.03)

Now that the concept is chosen, it's time to create the low poly version of the character. You could help yourself even more by drawing additional front and side reference pictures. I put the original concept in the background, and then I create some splines in the front view at different levels (top of the head, the chin, bottom of the pectoral, belly button, hip, knee, ankles and, lastly, the sole of the foot.)

From those splines, I model the low poly version with the correct proportions of the initial concept. It's important to keep the low poly exclusively composed of Quads (4-sided polygons), because we are going to export this model to Z-Brush (which doesn't support Tris).

Z-BRUSH – MODEL AND INTERFACE PREPARATION

With the low poly mesh finished, it's time to export it in .obj format. Be careful to have Quads selected as the type of faces and not Tris. Now we have a new .obj file that we are going to import into Z-Brush (Tool – Import). Click and drag to get the object in the viewport, and directly press the "T" key to put the object in draw mode. Next, I define the polygroups (Fig.04&05). Creating polygroups allows you to

Fig06

quickly isolate a part of the model to work on in a more efficient way. Moreover, when we have a high level of subdivisions, it allows the computer to work faster. So, to create a polygroup, you have to isolate a part of the mesh. To do that, keep pressing Ctrl + Shift, then click and drag on the part of the model. When you have isolated a part, you need to click on Group, visible in Tool – Polygroups. The isolated mesh takes a different colour. Repeat this step for each part of the model. To isolate a polygroup, press Crtl + Shift and click on the desired part. Two little things remain to be set up before we start to sculpt the model. The first one is to modify the mouse average value to 5. That allows a better flow of the stroke (stroke = mouse average). The second is to modify the attenuation curve and to activate the accurate curve mode (transformation – modifiers) (Fig.06).

Z-Brush - Sculpting

Now things start to get interesting. One of the basic things to keep in mind when you sculpt in Z-Brush is to always work each level of subdivision in depth, before going onto the next subdivision level. You should focus on the volume first, which is very important because if the masses or proportions are wrong, all the details you'll sculpt will add absolutely no
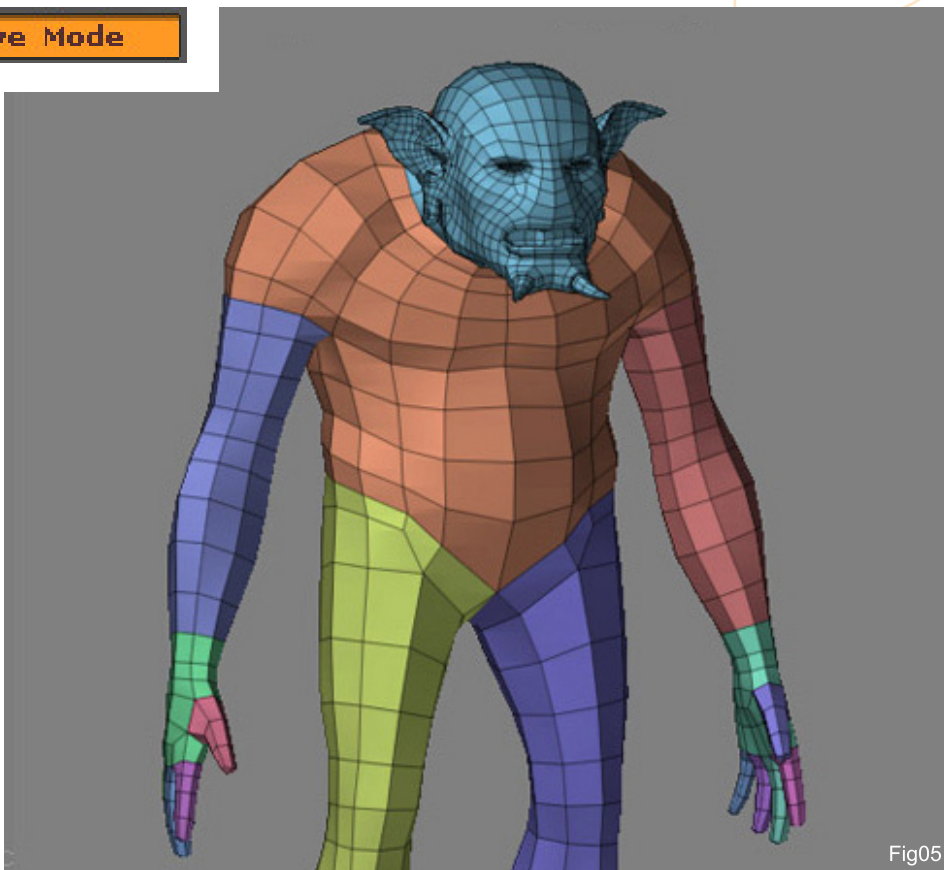

Fig05

realism. At a lower level of subdivision, I work on the full character at the same time. Then, once the shapes are correct and the main masses are in the right place, I work individually on each part. I start working on the torso, then the arms and the hands, followed by the legs and the feet and, at the end, the head (Fig.07a-e). During this step, I often jump between Z-Brush and 3DS Max to check the proportion of the sculpture with a good camera perspective. At the end, I check the whole model. You don't need to go too far into the detailing because we are going to retopologize the character to have a good mesh for animation (Fig.08).
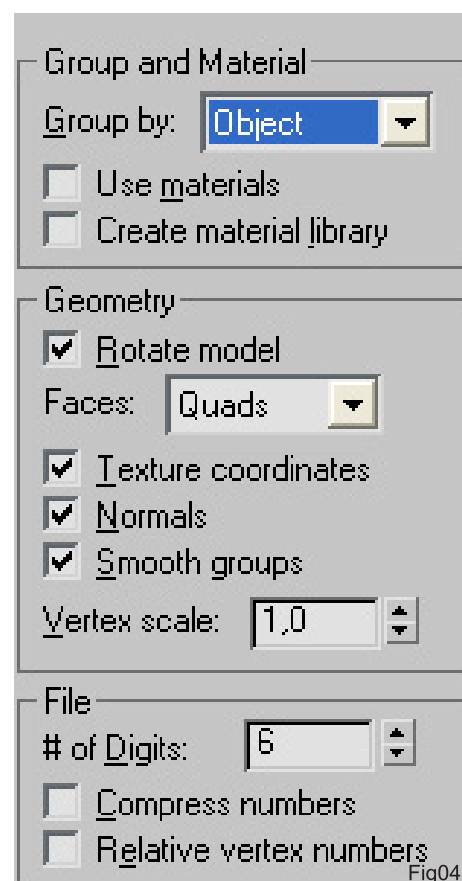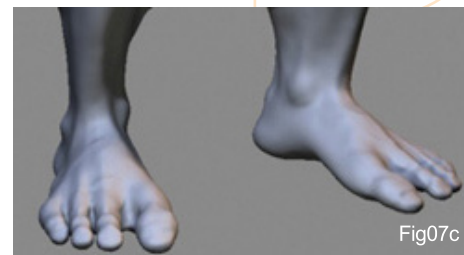

Fig04

Fig07a

Fig07b

Fig07c

Fig07d

Fig07e

Fig08

RETOPOLOGY

So, now I'm going to build a new hi-resolution mesh. Why? Well, firstly to have total control over the flow of the topology, but also because I'm going to use Brazil as the render engine and this doesn't deal with the micro-displacement. I'm going to use a normal map to have details, like the veins or the wrinkles on the skin, which I will talk about later. To retopologize the Z-Brush model, I proceed in several steps, working step-by-step and starting by importing the torso in 3DS Max. To retopologize,
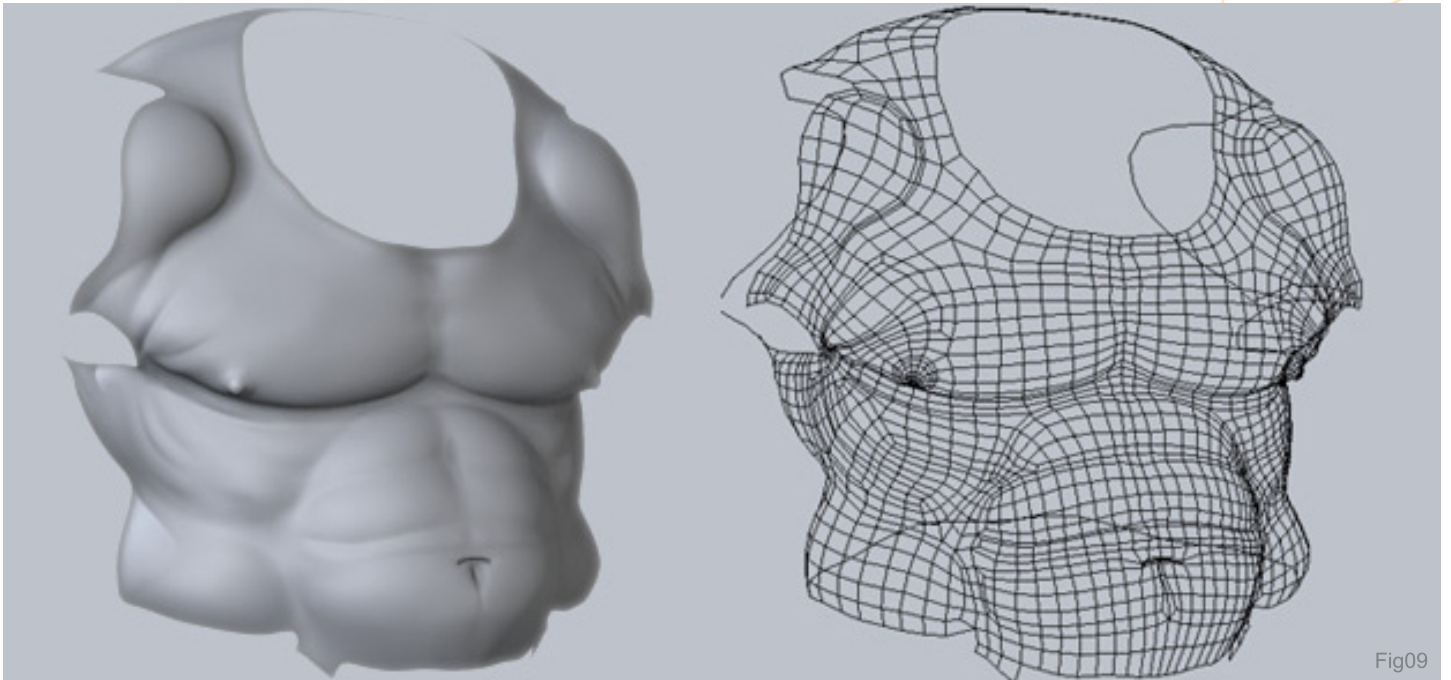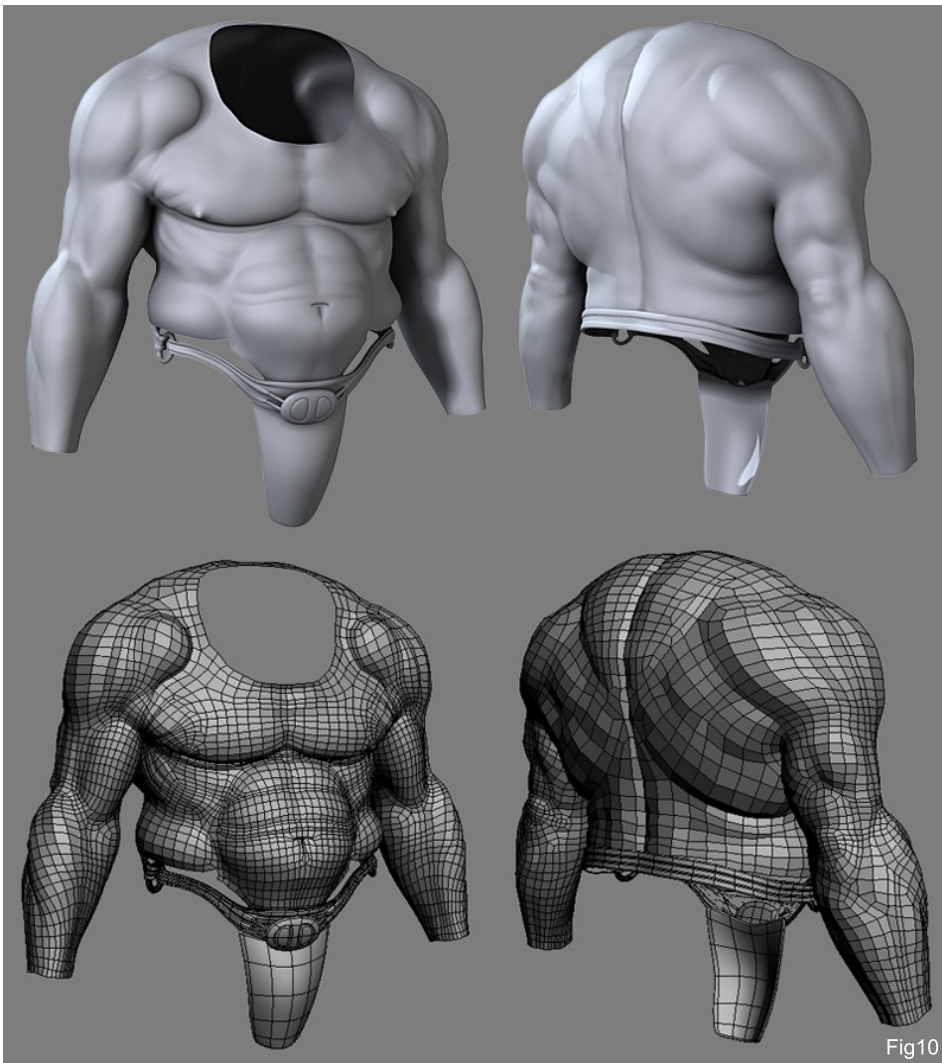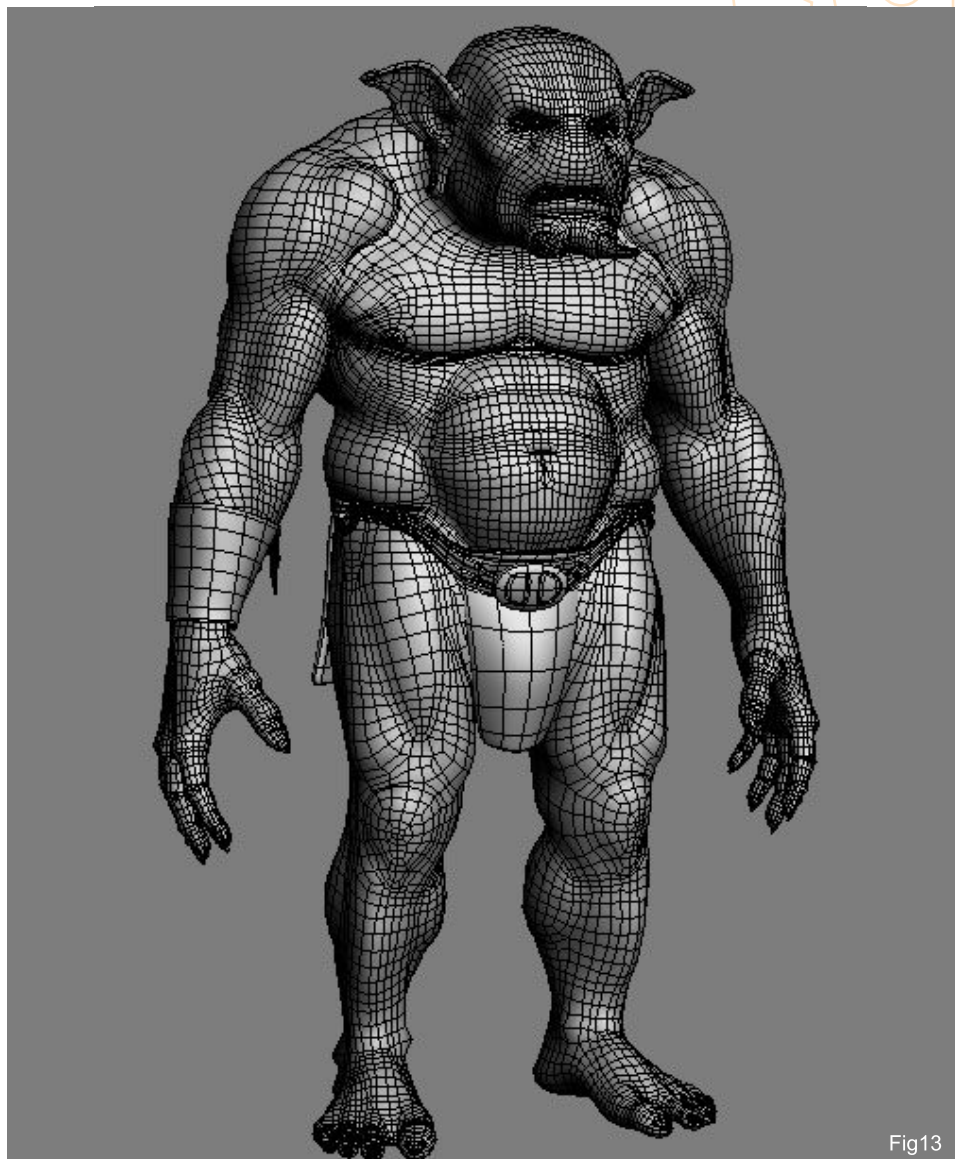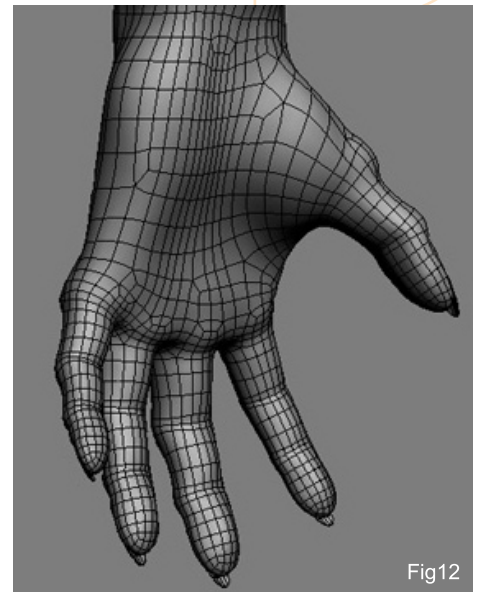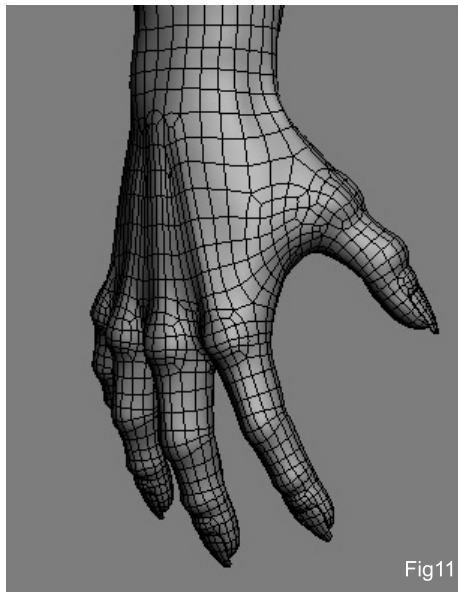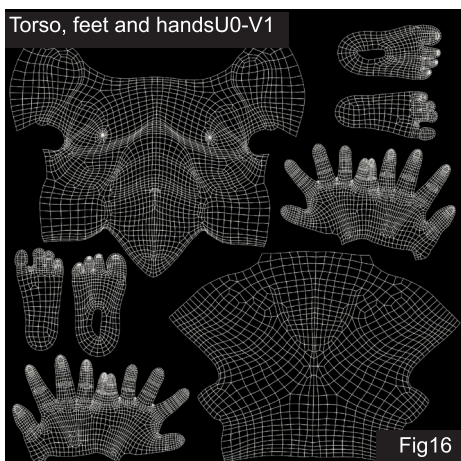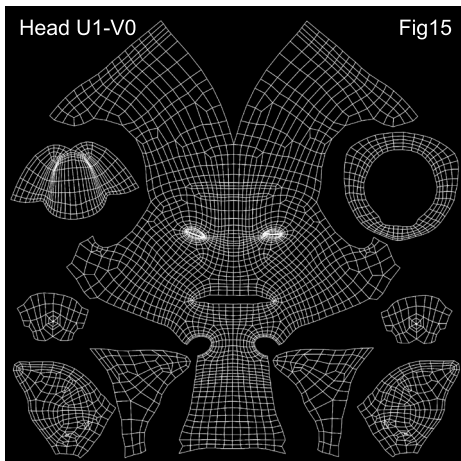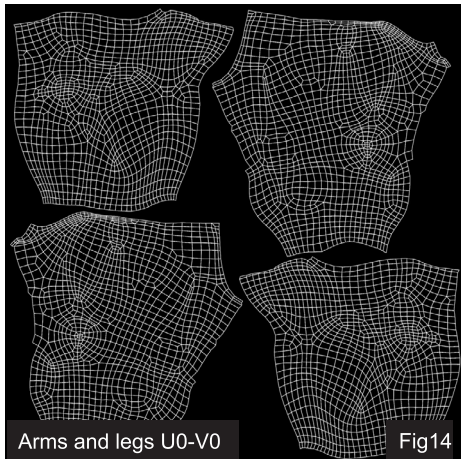
Fig09

Fig10

I use a plug-in called "Polyboost". With this tool, I can rebuild a new topology over the Z-Brush model very fast and efficiently. I first became aware of the power of Polyboost when I saw the Gnomon DVD by Ian Joyner (you can find the DVD at this link www.thegnomonworkshop.com). Once I have finished rebuilding the torso (Fig.09&10) (you only need to rebuild one half of the model because we can use a symmetry modifier for the other half), I delete the Z-Brush mesh and keep the new torso. Then I import the arms, and I restart the previous step, keeping aware to have the same number of vertices in the intersection of the 2 parts (here, the neck). I then delete the Z-Brush arm and I weld the new arm to the torso. Then I repeat the process for the other parts until my character is complete. For a preview of the way Polyboost works, you can download some videos from the official website (www.poolyboost.com). I also decided to remake the hand completely, because I didn't like those on the Z-Brush sculpt. It's very important to keep a mesh composed exclusively of Quads and evenly spaced. If you have to put a tri somewhere, do it in an appropriate area (unnoticeable), like under the arms or inside the mouth. The rebuilt wireframe mesh can be seen in Fig.11&12.

UV Unwrap

Regarding the UV, I prefer to use different space UV's and to not have to use a material ID for the SSS shader, as this could create some artefacts in the render. Having an evenly spaced polygon mesh makes unwrapping easier. Fig.14,15&16 show the UV's of the body unwrapped on 3 different UV spaces.
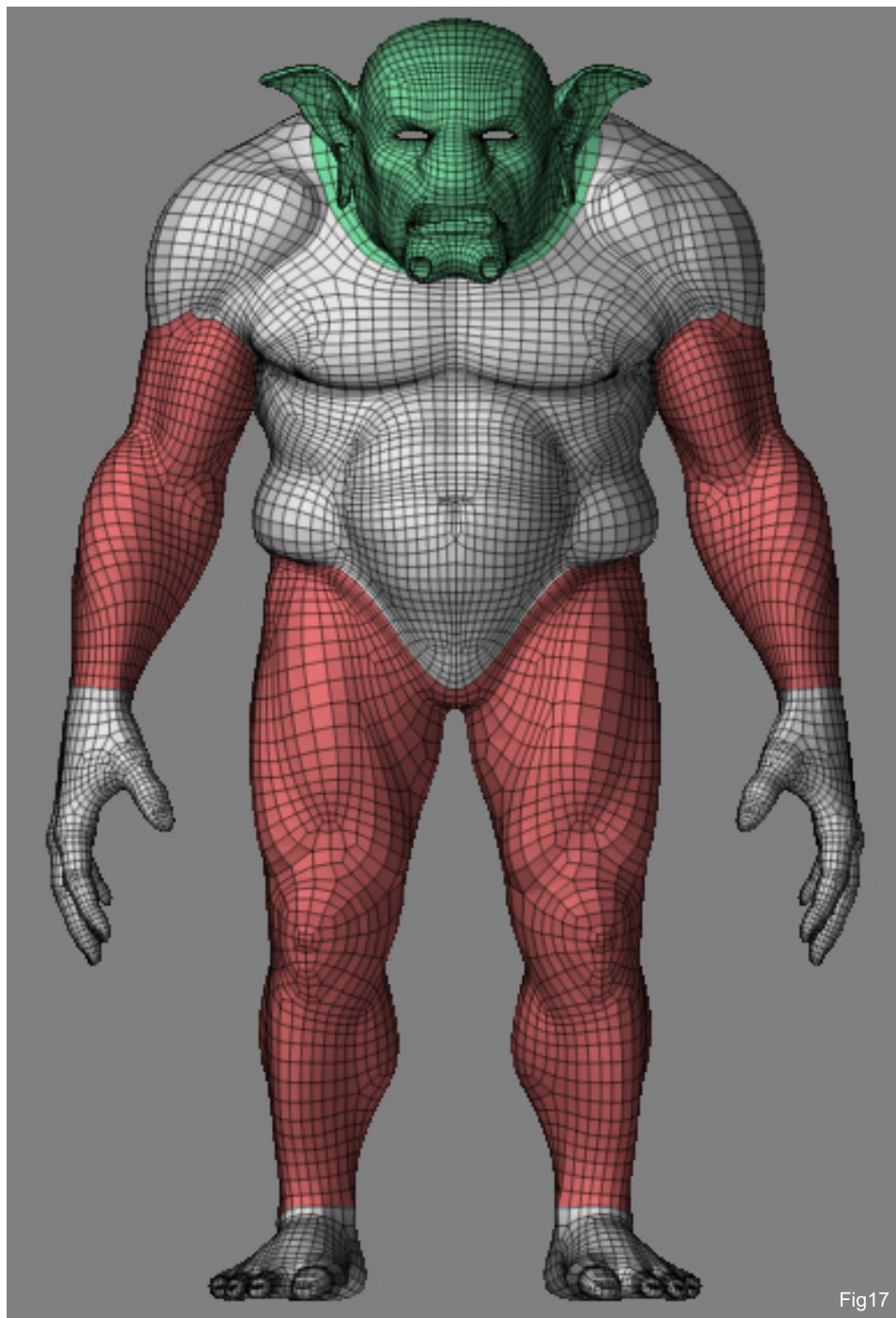

Fig11

Fig12

Arms and legs U0-V0   Fig14

Head U1-V0   Fig15

Torso, feet and handsU0-V1

Fig16

Fig13

Fig17

Fig18

Fig19

Finalisation in Z-Brush

Once the UV's are unwrapped and laid out in
their respective UV space (Fig.13), it's time
to import the new model into Z-Brush so that
we can proceed with the finalisation of the
character. The first thing to do is to click on the
UV Groups button in order to distinguish the
polygroups according to the UV space (Fig.17).
Next, we can isolate a part and start to sculpt

the details, rework the muscles, the mass
etc. (Fig.18&19). As soon as the sculpture is
finished, I move onto the creation of the bump
map. It allows adding some finer details without
increasing the poly count. To do that, you need
to select another shader: the bumpviewer
(material - load) which you can find in the Z-
Brush folder. Next, you need to create a grey
texture (126). At that moment, you have the

possibility to paint the bump directly onto the model with a real-time feedback. To create the bump, I mainly use "projection master" and I use some custom alpha brushes (Fig.20). As there are three UV spaces, you need to paint a bump map for each space. Eventually, you will have 3 bump maps.

EXPORTING NORMAL MAP

Z-Brush can't export multi-normal maps all at once (but it's possible with displacement maps - you can do it with a plug-in called multi displacement on www.Z-Brushcentral.com). We have to isolate each part, one after the other, to extract its corresponding normal map. To extract a normal map you need the plug-in 'Zmapper', which you can find on Z-Brushcentral.com. Fig.21 shows the final result after rough skinning.

Fig20
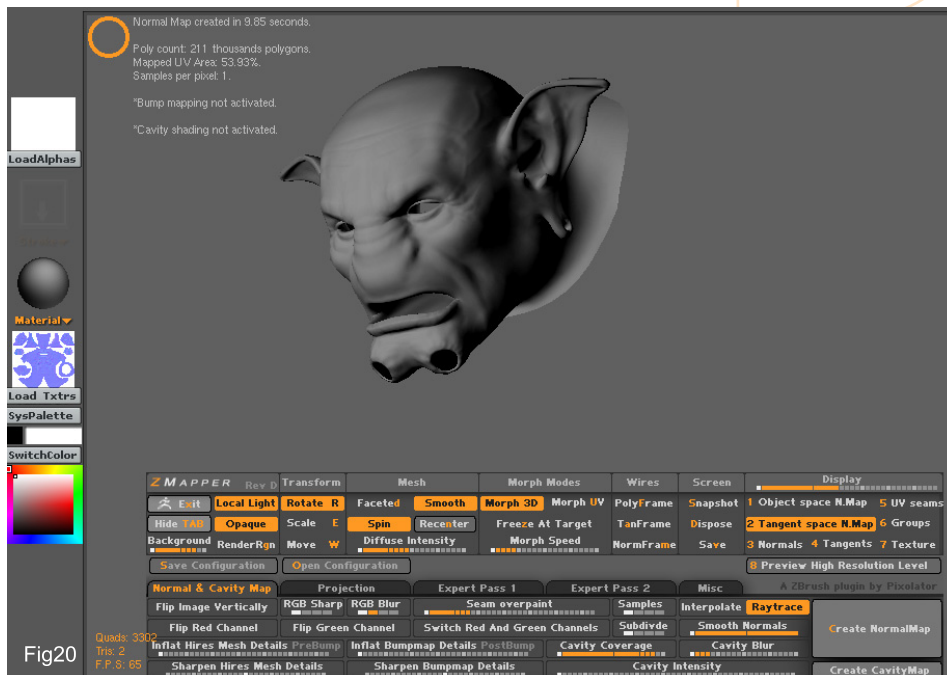
NICOLAS COLLINGS

For more work from this artist please visit:

http://sillord.free.fr

or contact:

ncollings1@hotmail.com

Fig21