

Mapping (and texturing) Characters in GMax

for Ultima 6 Project and to whomever interested
by Niko Mäkelä on March 5th 2006.

Ok, I'm am by no means a mapping expert. And this certainly isn't the only way of doing this, but it is my way for now. I'll just assume you want most explained so that's how this will go: first general stuff, later step-by-step mapping a character.

UVW-MAPPING, WTF?

UVW-map is a way for the program to wrap 2D-picture around a 3D-object. UVW-MAP is a modifier you can apply. Settings are for instance planar, spherical, cylinder and box. Planar and cylinder are best for organic objects that have many shapes in them going and pointing whichever way. Say cylinder is good for arms and legs, sometimes torso and head too. Planar is good for select bits that don't work with cylinder, sometimes you have to planar map everything. Different shapes need to be mapped differently. Otherwise texture, while looking ok in one spot, will stretch and look ugly elsewhere.

UVW-MAP has a gizmo that allows you to resize, rotate and move it over your object. That way you can orient your texture the way you want. Often you should rotate your UVW-gizmo and choose where the seam(the green line) is. More about this later.

Unwrap UVW

This allows you to unwrap your uvw-mapped objects surface info on to a 2D-plane and edit it there. There you can also load up a bitmap that your object uses and move your UVs so that certain bits get certain bitmap parts.

You can also unwrap a non-uvw-mapped object, but that just gives an unmanageable mess.

Uses and limitations of UVW-Mapping and Unwrapping

1. You can apply UVW-mapping to complete object or sub-selection.
2. Unwrap UVW-modifier goes over your UVW-map and only unwraps the object/part currently UVW-mapped below it. If you then go back to UVW-map-modifier and map another part with it, that part will be unwrapped as well(and previous lost).
3. If you right click and "collapse" your object stack with uvw-map in place, it will stay fixed on your object. Unwrapping shows it still there. But if you uvw-map again, say a different body-part, previous mapping is lost. Mappings don't get collected.
4. Unwrappings can be saved and loaded again as long as the geometry they refer to stays the same (no additions or deletions). But unwrapping doesn't let you load more than one setting at a time, you can't combine them.
5. You CAN place several UVW-maps and Unwrappings on top of each other (in stack). Read on.

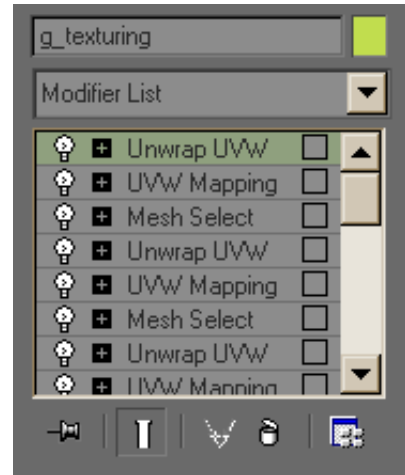
METHODS

”How to” in brief

UVW-modifiers have many limitations. But Gmax allows you to stack tons of modifiers on a single object, literally on top of each other. So you can use several Mappings and Unwrappings at the same time. The trick of it is to use Mesh Select-modifier in between.

So, in short you UVW-map and Unwrap a complex character by applying Mesh Select, selecting whatever, UVW-mapping it, Unwrapping that and then repeating until all parts are done. Then you can ”collapse all” and apply unwrap on what is left: your model. Mappings are still there and editable.

But of course there's more to it.

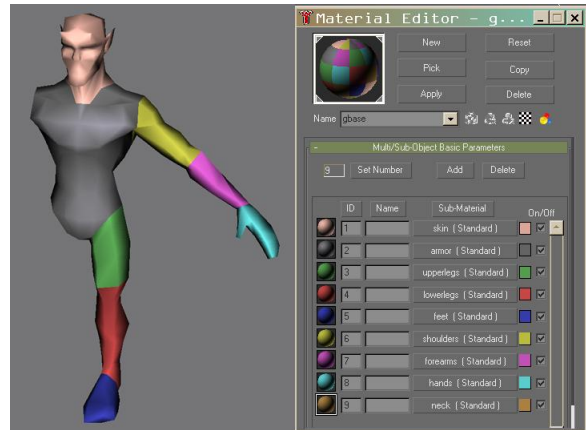


One important thing to note when you begin is duplicates. Can you use the same bitmap for your characters arms for example? Hopefully you can. Then you can remove all parts from one side of your mesh that will have the same material as parts on the other side. Later you mirror mapped and textured parts over. It saves work and texture space. The more surface area your parts have in your texture-map, the more detail they get. This is how most Dungeon Siege models are mapped. Downside is same texture on both sides hence not unique and may look too symmetrical.

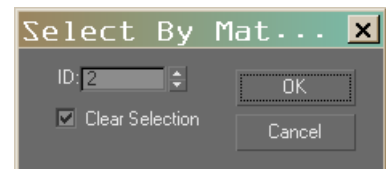
On methods

Problem with UVW-mapping single object several times(in sections) is that when you unwrap, all those mapping are there but on top of each other. So you need to separate them somehow. I know 2 methods so far.

Images on the right show **method one**. You apply a Multi-Material and different material IDs to an object. You don't need to apply actual sub-materials on it but it helps to keep track of things.

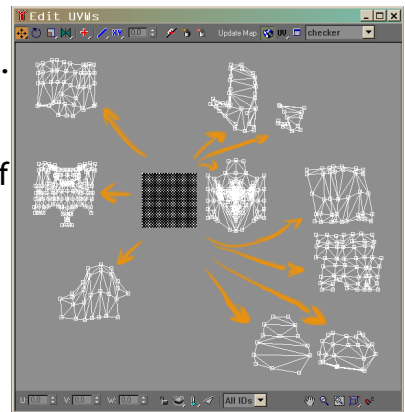


Those Materials IDs can now be selected directly when you Mesh Select. **In this method you don't need to apply Unwrap on every mapped part.** You can unwrap when all parts are mapped and stack is collapsed. Then UVs can be selected via material ID in UV-Edit Window and edited without trouble.



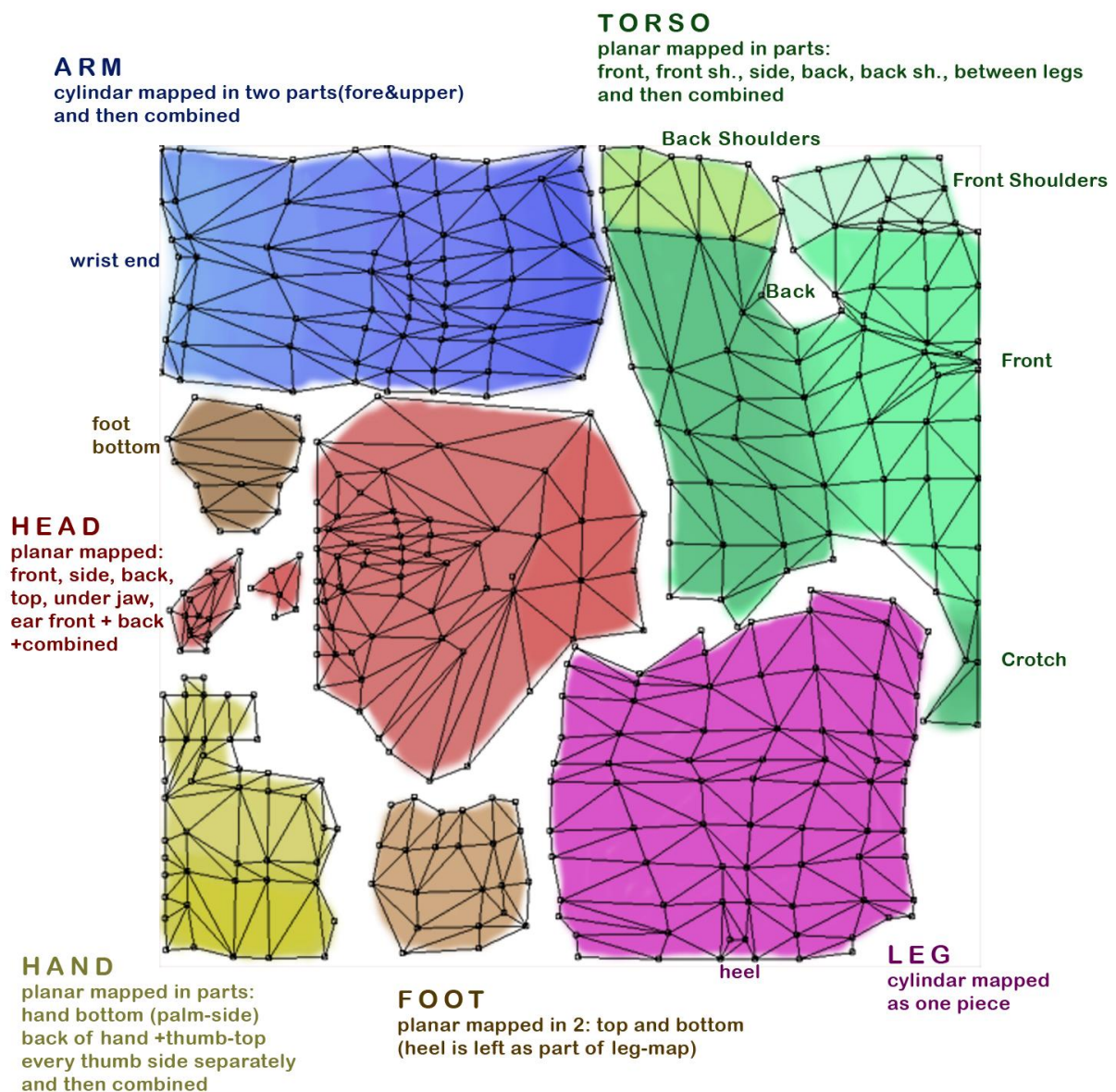
Problem in this method is messiness - you have tons of IDs even though in the end you usually just want to apply one material. You still can use just one material, even remove all previous materials, but the old IDs stay in UVedit window. If, for example, you plan to use two bitmaps and hence two materials IDs on your character, method one becomes a real problem.

Method II is what I currently use. Here you build and excessive stack of modifiers like seen in pic on previous page. You apply Unwrap UVW at every step. AND in every step you open your UV edit window and move the UVs somewhere off-centre. Keep doing this and none of your UVs will overlap - if you don't place them in the same place yourself. Don't worry, you can keep editing every single modifier in your stack as long as your stack stays uncollapsed. Once done "collapse all" and apply Unwrap UVW. Your mappings are all there and you can have them all under one material ID.



PLANNING IS EVERYTHING

It is always easier to plan ahead, UVW-map and edit UVs than trying to paint texture on something that's messy or had to understand. So think how you will UVW-map that chest that you will later still understand it to be a chest. Plan it.



That's how gargoyle was laid out in UV's. Note that I use duplicates: one texture on one half of character is reused on the other side. So I only map one leg, one arm and so on. I put some colour on to indicate what's what and used slight variation to indicate what's front and back. I hope it helps.

In the end I planar mapped almost all. Only leg and arm are done with cylindrical-mapping and it might have been better to planar map leg too. Once all parts were mapped, stack collapsed and Unwrap applied, I joined the pieces together where possible. You can weld the vertexes together. Just be careful to join the correct edges - it is very easy to make mistakes. Connecting is good because the less seams you have, the easier it will be to texture.

STEP BY STEP

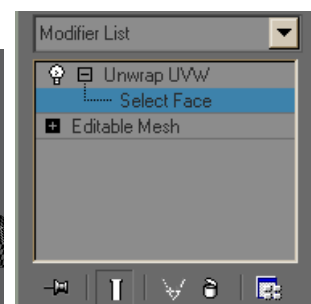
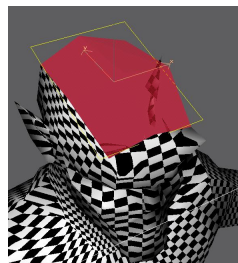
UVW-Map it

- x Apply Mesh Select-modifier.
- x Select your part 1.
- x Apply appropriate mapping with UVW-Map modifier, make it fit nice and snug.
- x Rotate UVW-MAP-modifiers gizmo(found by opening your modifier) so it fits the best and so that the green line it has is where you want the seam to be. For torso it could middle of the back. For the head probably back as well.
- x Unwrap UVW. Edit your UVs by moving them off-centre, make mental note where.
- x Mesh select again, apply map.. rinse and repeat until all parts are done.
- x Putting a repeating texture like "checker" on "diffuse"-channel helps see how your mapping will look, really it is a requirement for working.
- x Save your file and then save under a new name. No need to remind about making progressive backups after this I'm sure.

UVW-edit

- x Now you can flatten your mappings. Do "collapse all" and then apply Unwrap UVW.
- x If some are impossible to clean or understand, you can select unwrap-modifier and, hit "+" to open it and then select some faces you want to edit easier. Hit "Planar Map"-button in the modifier-rollout. It takes those faces away from current mapping and brings them in as separate planar-mapped UVW-part.
Example gargoyle's head top, ear, back of ear, underneath jaw..

- x It is important to understand all parts easily as what they are, because you will paint a texture using these and it will replace the checker you see in your edit-window. Rotate and edit all so you understand them best as body-parts.



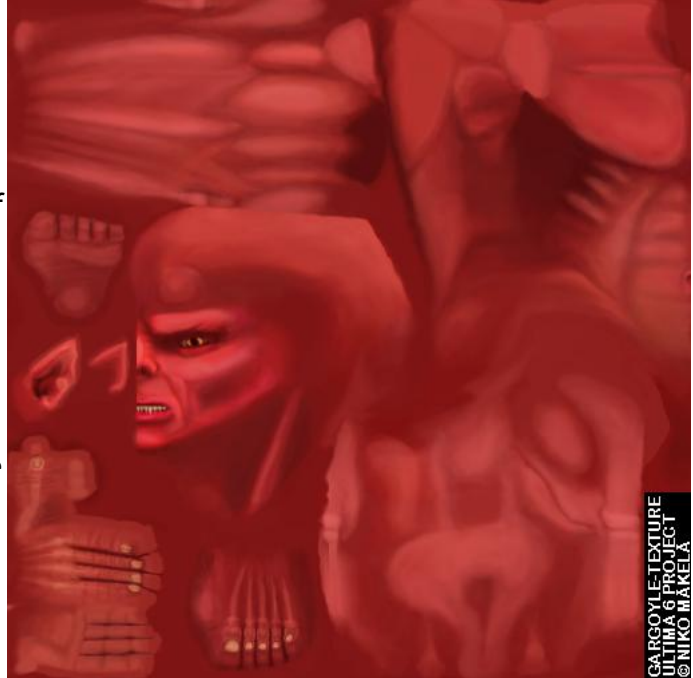
- x Also important is to size them so that checker map looks the same on all (check from your model) and flows somewhat nicely from one to another. Head or face is often left bigger than it really is, because as bigger on the map it gets more texture area, hence more detail.

- x In the end the goal is to fit all those bits on the texture in the centre of the screen. Don't let them intersect. If you can get body parts next to each other that really are so in the model, you can weld their border vertexes together for better texture flow. Do it if you can - just be sure to weld correct parts.

Texturing and finishing

When mapping's good, you can start painting your texture. Make a base pic first with base skin color and get it onto your model. You can get your material into UVW-edit-window via "Pick texture" at the top. But first take a screengrab of your uvw-map to paint program for reference. Now just paint and skip between your paint program and SiegeMax/Gmax. You will probably have to adjust your UVs still.

Get your bits in uvw-map-view share the same looking material on their edges so they connect well on your 3D-model. That is make sure they have the exact same colour of pixels: either use the same colour or copy pixels over from the other part.



In the end you can just collapse your unwrap-modifier on your model and call it done. Last step is mirroring IF you use duplicates(recommended where possible). Mirrored body parts will then use the mapping already in place and the texture as well.

Quick recap

- 01 Remove body parts that will be mirrored over from other side
- 02 Mesh Select and UVW-map, Unwrap, move UVs off center.. repeat steps until done
- 03 Collapse All
- 04 Unwarp UVW
- 05 Fix some parts with applying planar sub-selection (under Unwrap-modif.) to some bits
- 06 Move, rotate and scale bits to make some sensible order and fit them over bitmap. Take your time here, do it right.
- 07 Edit and weld some for better transitions
- 08 Make a new bitmap, apply it to a material and that material on your character
- 09 Screen capture map wireframe, take it to a paint program
- 10 Paint textures
- 11 Collapse all
- 12 Mirror some parts if you use duplicates, attach those parts.



I hope somebody found this guide helpful. Thanks for reading.