

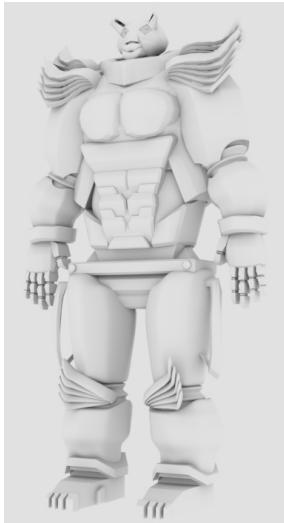
OLYMPIODS: lighting & rendering

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CHALLENGES & HIGHLIGHTS

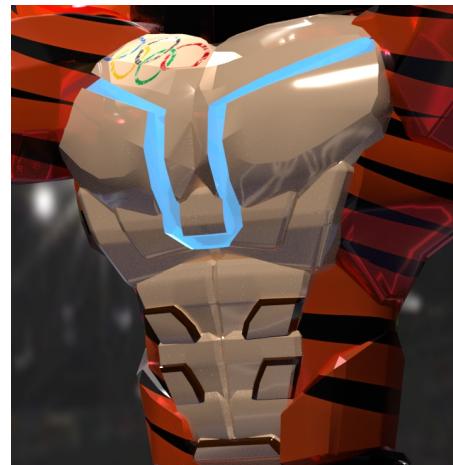
Re -Modelling of Geometry



As we can see in the image on the left my character was in the basis N-pose for the first submission. For the second submission we need a distinct pose for our olympic hero with respect to the relevant sport. This implies that we need a little bit of re-modelling of character.

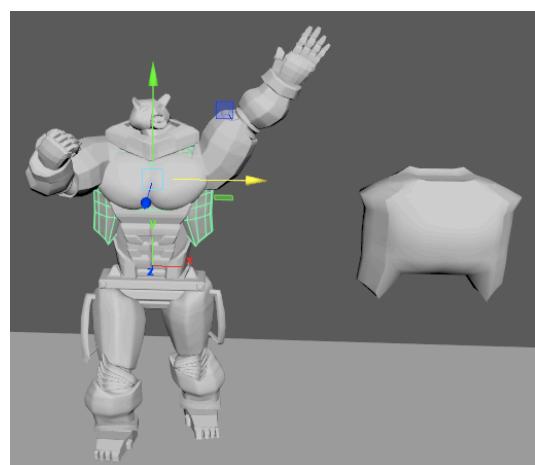
I wanted my character to wave one hand to the crowd so I had to remodel the upper arm, the part where it touches the shoulder socket. I had designed my hindlimb and forelimbs with multiple joints so that they can freely move around. I took the opportunity to improve my hero model by re-modelling shoulder, stomach, breasts.

Performing the booleans difference on the objects turned out to be pretty challenging here. Applying booleans difference makes both the object disappear. I properly analysed all my components but there was no sign of non-manifold (broken) geometry at all. After a lot of researching and reading numerous Autodesk forums, I made an assumption which I am not completely sure is right reason. What I noticed in my geometry is that I had lot of objects were inverted or scaled -1 after duplication. Sometimes inverting the objects and repeatedly duplicating can cause the vertex (tangents) to point in the wrong direction even with smooth manifold geometry. So I found out that the solution is to freeze transformation from the modify menu bar and then you can apply boolean difference to anything.



I have redesigned almost the entire torso to get a triangular shape instead of a rectangle. Here I used booleans union to combine the abs and the breasts and them and then apply booleans difference against a sculpted cube to get the engraved pattern on the chest.

To get one hand to wave upwards and other to have a clenched fist I had to change the pivot point of every single component in the entire arm from the fingertip up-to the shoulder (using 'd' keyword).



I also had to re-structure the geometry of hero's head. In order to get stripe textures on the head I needed triangular faces. So I had to break quad topology and insert triangles faces. I tried using the triangulate feature but it was unpredictable and not very useful. I used multi-cut tool instead which was instrumental in modelling my hero character.



Texturing

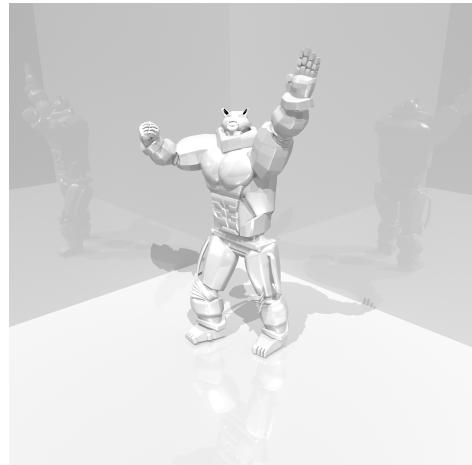
After re-modelling my hero the first thing I did was remove the ambient occlusion shader. This is a shader that just simply measures the distance between two vertices and generates a greyscale image based on that. For texturing out Olympiad we need a much more complex and detailed shader.

After making sure in the hypershade that ambient occlusion was deleted I started experimenting with the Blinn shader.



I assigned Blinn shader to the entire geometry and started to play with ray tracing to vary the reflection, refraction, and the type of shadows I was getting.

Then I added 3 image planes to get a studio like setup and get the reflection of robot on all the walls- back, left and ground. I also increased both the reflections and refraction to



high value of 10 to get the maximum effect.

Then I experimented with the AI standard surface shader. For a start I applied it to all my geometry. And when I render it, I could observe straight away that the default setting for ai standard surface had a much better glow and finish, without even changing any of the values in the attribute editor.



It had much more variables to customise our geometry and had more realistic portrayals of not just metallic object but of almost all kinds. The Ai has the potential to create endless possibility of objects. So I was playing around with it to discover what it could do and did a random art with checker pattern.



After spending some time varying the ai standard attributes I was convinced and decided to use this to render my hero. My hero is based on a tiger. Then I first created 3 new ai standard surface shader with 3 base colours for the hero.

- Ai orange for most of the body : links orange colour
- Ai peach or skin colour for chest, mouth : links peach colour
- Ai Black for all the joints, waist and neck disc : links shiny black colour.



After that I created 2 more:

- Ai standard for stripes on wings : links to a 2d image file texture, i.e. an image of stripes that I downloaded from the internet.
- Ai standard for stripes on legs, hands and torso : links to a 2d image file texture, i.e. an image of stripes that I downloaded from the internet.

When I assigned the ai stripes to the hero the stripes were not displaying correctly so had to modify the UV planar from x-axis to z- axis for all of the components of body.



After that I wanted to assign two different colours to the same part. Now there is a lot of ways to achieve this.

One is to link a ramp texture and have the two colours which also has an option to blend the two colours gradually and then select the faces in UV editor for the respective colour.

Here in this case I was not looking for blend I wanted sharp difference. There is also another way of getting the same result. We can just select the face and assign them new material and give them a different ai shader.

For the first time I did use the UV editor the assign different colours but after that I just selected respective faces and assigned them different shader. It is much easier and faster to just assign the faces separately than editing in UV. I also found it easier to work with faces and not UV because in a lot of parts I have used 3-4 different shaders for the same object and it is not of the same type. Some of them are a colour texture, some image file texture, some pattern texture.

I created more ai shaders:

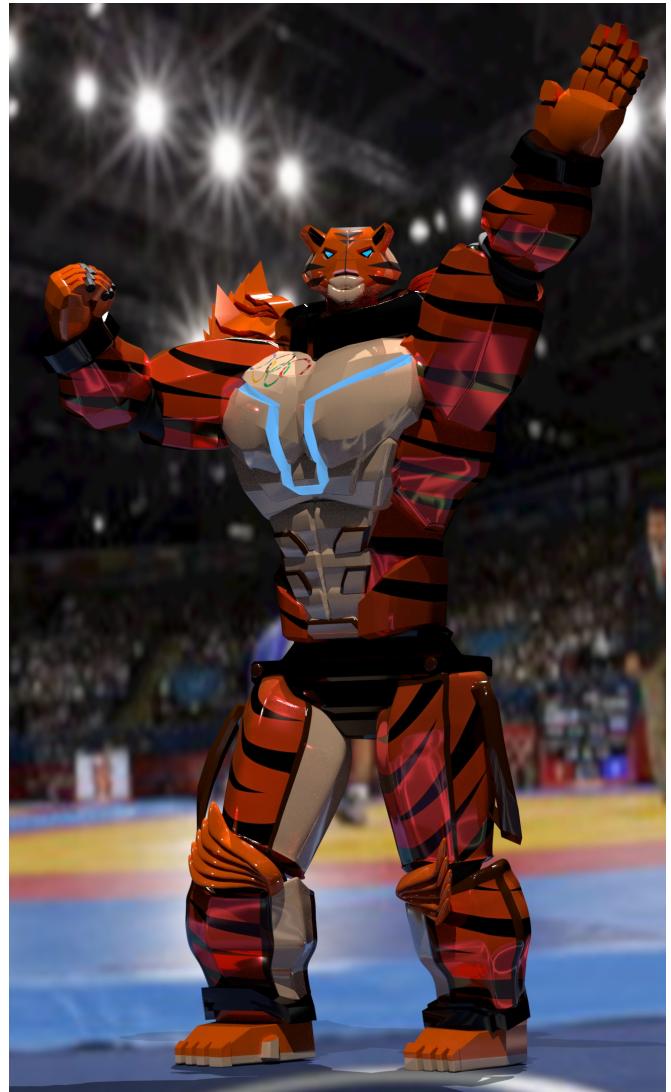
- Ai standard for eyes - high emission of blue colour.
- Ai chest light - high emission of light blue colour.
- Ai pink - for nose
- Ai border brown - for making border and lines on legs, chest, arms
- Ai black matte - for joints and stripes on the face
- Ai logo olympic ring - for printing rings on chest.

For my entire body in general I have

- Base wt : 0.8
 - Metalness : 0.3 - 0.5
- Specular wt : 1
 - Specular Roughness : 0.1
 - IOR : 1.5 - 2
- Transmission wt : 0.5 (only for neck/palm disc)
- Coating wt : 0.5
 - Coating colour : orange
 - Coating roughness : 0.3
 - IOR : 1.5 - 2
- Sheen wt : 0
- Transmission
 - Transmission wt : 0.5. (only for chest/eyes)
 - Transmission colour : light blue-blue
- Thin Film
 - Thickness : 200-450
 - IOR : 1.5

The hardest parts were :

- Face : making triangular topology for each individual stripes and assigning almost 5 different shader to one object. Individually mapping different shaders to every face was time consuming to get a very detailed face.
- Chest : Placing the olympic ring logo on the chest perfectly on such a curved surface was very tough - done in UV editor. I had to create my own texture map in photoshop editor . Match colour of body, get the colour online and map logo on the object.Then filling engraved cavity with light emitting material.
- Legs : placing brown borders on different textures. Did it on UV space and it took some time



Lighting & Rendering

Image Background: I just added an image to the environment of the camera and made depth to 1000

Camera : I am using a normal camera with 30 focal length camera with angle 55 degrees and far clip plane 1000.

Lights : I am using a lot of lights in my scene to get a very high quality pseudo-real lighting. I did my best to get it very close to actual lighting in a night lit - indoor stadium. I am using

- **7 spot lights** - all position where there is light in the background image and focus on the hero character. They all have linear decay.
- **3 directional light** - one not producing any shadow place alongside camera toward the hero. The other two place according to background to produce correct shadow.
- **sky dome light** - to create a bit of foggy effect
- **foggy effect** - Maya renderer foggy effect

