Assignment-2 FMX Modeling

Subject: CS675 - Computer Graphics

Team Member:
1. Jaimin Chauhan (213059005)
2. Arnav Mishra (213059002)

Humanoid Model

- There are 2 files "humanoid.cpp" and "humanoid.hpp" that contain logic for the humanoid model. We use cube as a primitive shape for body parts. For the head, we use a sphere.
- For the cube we use 36 vertices and connect them using triangles. For the sphere, we first divide the sphere into sectors and slices using latitude and longitude. After that, we use triangle strips to connect them.
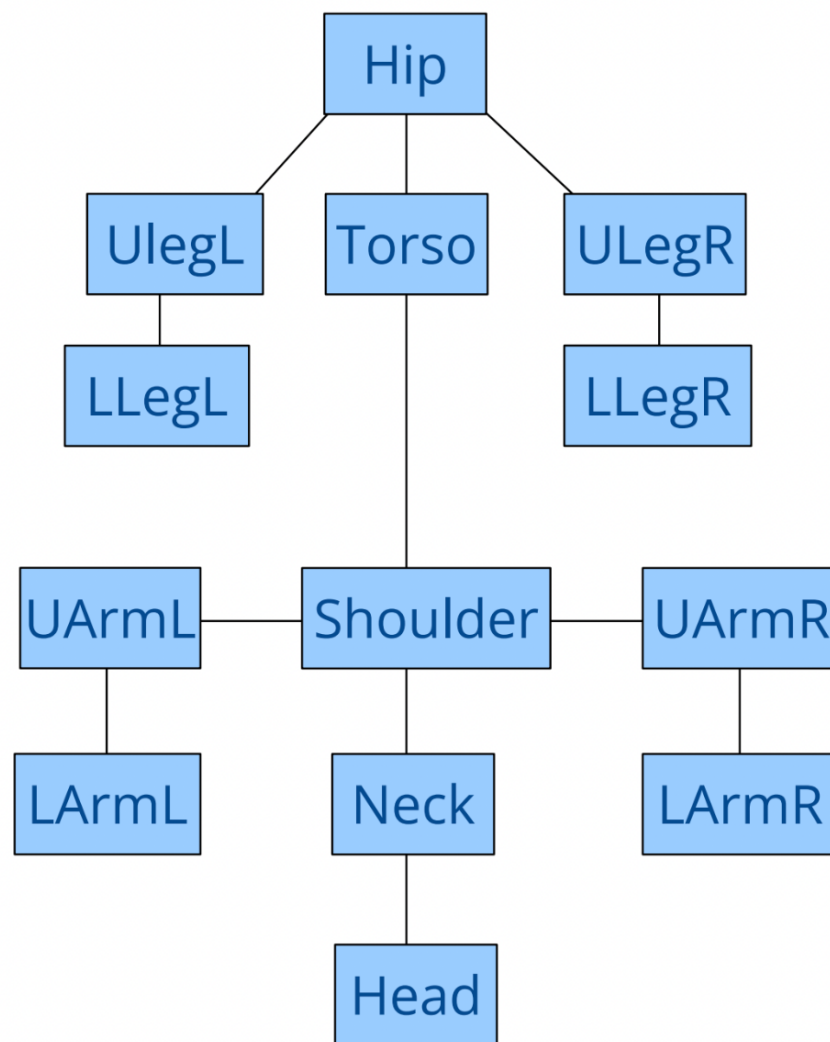- Here I attach a tree structure for a humanoid.

Fig:1 Humanoid Tree Structure (Ref. from CS675 lecture 9)

● For movement of body parts you can use the below key mappings.

| Key	Body Part Selected
1	Hip
2	ULegR
3	LLegR
4	ULegL
5	LLegL
6	Torso
7	Shoulder
8	UArmR
9	LArmR
SHIFT + 1	UArmL
SHIFT + 2	LArmL
SHIFT + 4	Head
Left arrow / Right arrow	Body part movement axis Y
Up / Down arrow	Body part movement axis X
[/]	Body part movement axis Z
A / D	Global movement axis Y
W / S	Global movement axis X
Q / E	Global movement axis Z

Table 1: Key mappings for Humanoid

Bike Model

We used cylinders to design most of the bike except the seat, the engine core and the back tyre and engine connector for which we used frustums.

The main logic for the bike model can be found in the modelling_bike.cpp.

For the code of cylinders and frustum please refer to the cylinder.cpp and frustum.cpp respectively.
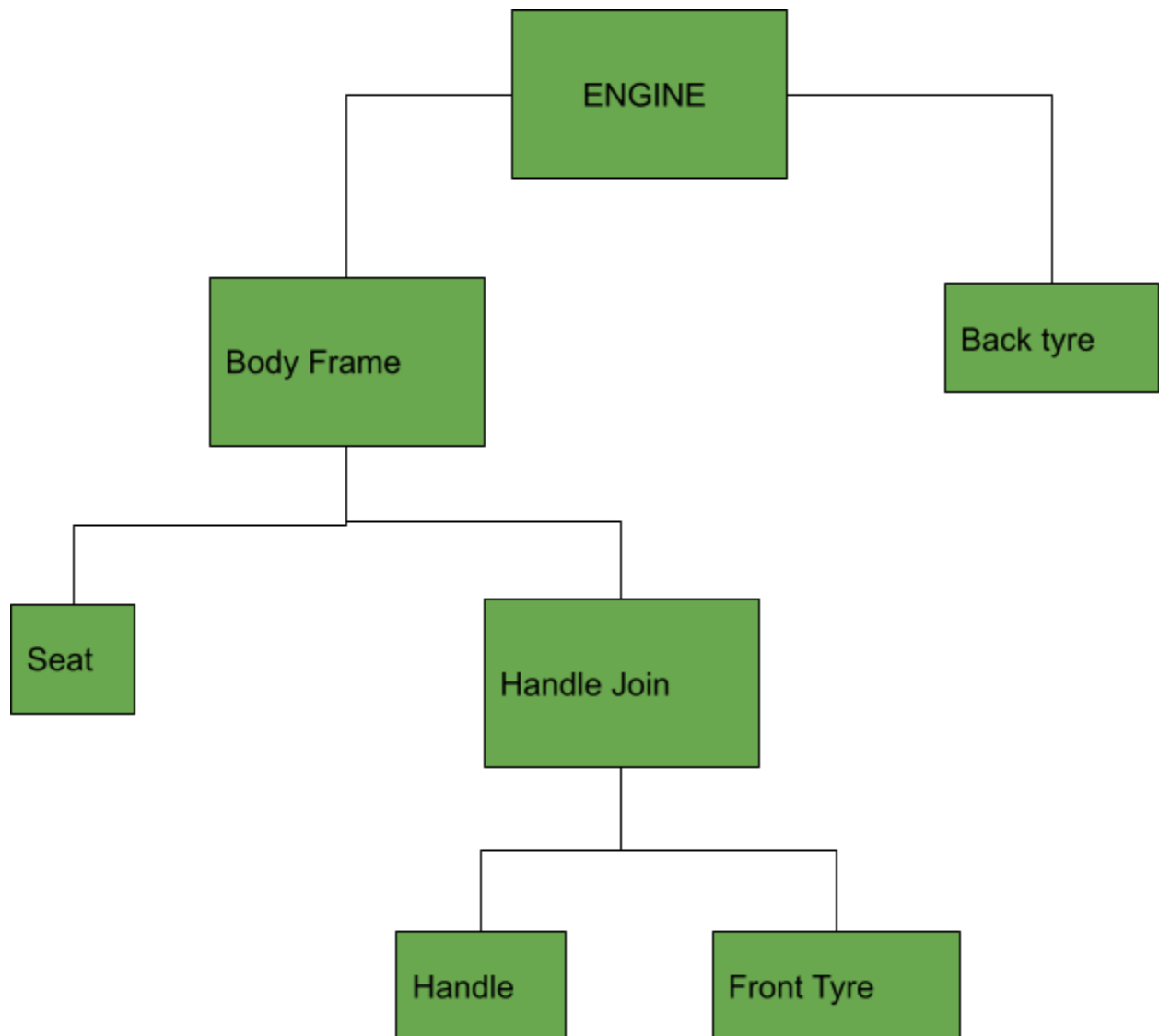
Fig:2 Hierarchy model for BIke

Key Bindings:

Key	Movement Type
Z/C	Handle rotation along with front tyre
I/O	Front Tyre Rotation
T/Y	Back Tyre Rotation
N/M	Bike Translation backward/forward
A / D	Global movement axis Y
W / S	Global movement axis X
Q / E	Global movement axis Z

TRACK

- In file structure modelling_track.cpp and modelling_track.hpp contains logic related to track. For building a track, we use a vertex grid and connect vertices using a triangle strip. If you want to change tesselation for terrain so you have to change the value for the variable *"tesselation"* in track.cpp file (As of now it is set as 500).
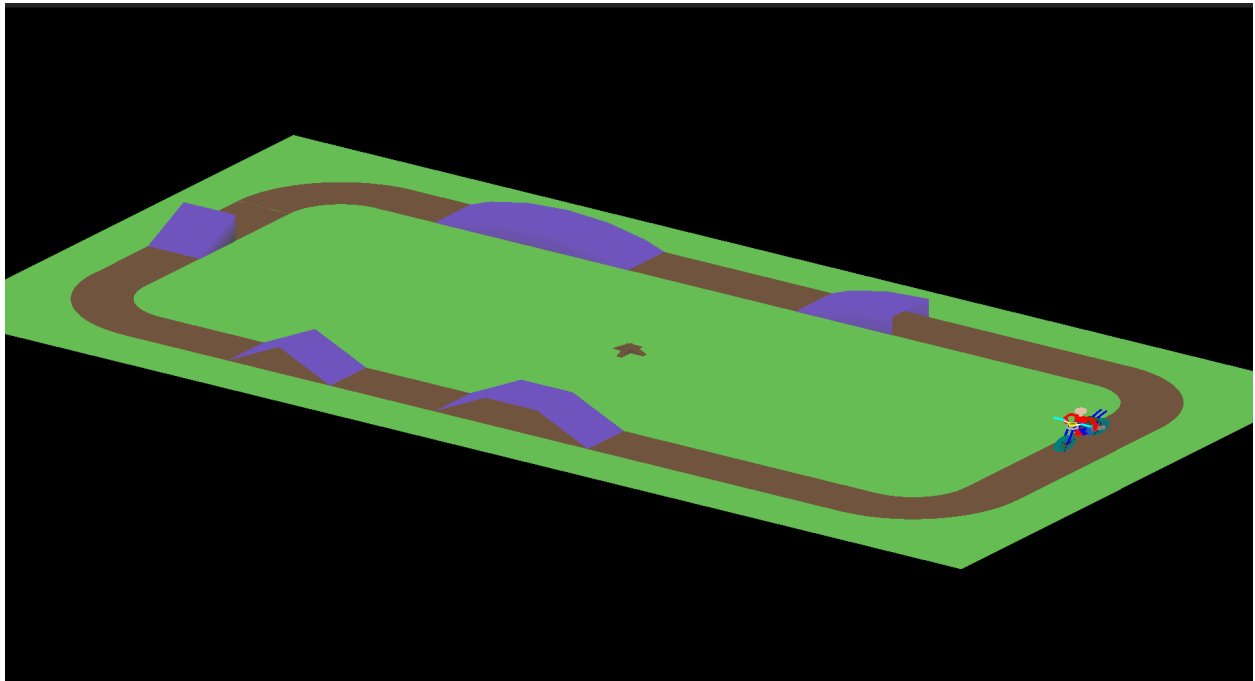- For each object we use the same logic as above and adjust the x,y, and z according to the geometry.

Fig 3: Track Model with Humanoid and Bike.