

EXPERIENMENT OF CONVERTING ANIMATED VIRTUAL CHARACTER INTO X3D/VRML

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1. INTRODUCTION

For documenting character performance, to find a method to re-animate the documentation will be an essential stage of presenting output. In RECITE team, people are working under different software. Therefore, to define a platform which could re-animate documentations and merge output of different PhD project is a significant consideration. X3D¹ is a XML based file format for representing 3D computer graphics online. A specific systematic system called H-Anim is defined to representing humanoids in X3D scene.

A series of experiments has been done to explore the possibility of producing human figures in X3D or its early version VRML97. First of all, section two will briefly introduce software which has been used for creating and converting figures. Next section will illustrate two feasible approaches. The third section will focus on the issues in the producing course. Finally, a conclusion of the entire experiment will be drawn.

2. SOFTWARE

The initially starting point is to load a per-edited BVH motion file to figure model software. The BVH motion was produced by manually mapping 3D character gestures with real people's movement. There are a number of software could import BVH motion, in this report, Poser 8² and MotionBuilder 2011³ has been examined. Poser 8 is a 3D character animation and rendering software produced by Smith-micro. It is designed to manipulate highly detailed human figures and has been widely used in 3D CGI industry. In contrast, characters made by Motionbuilder 2011 are not as good as Poser 8. However, as a member of Autodesk family, Motionbuilder 2011 supports Autodesk fbx format as output motion file, which could be loaded into Autodesk

3ds Max⁴ or Maya. Because 3ds Max 2011 has an VRML97 exporting function, it will be considered as the last step of converting. In other word, character with motion will be tranfered to Autodesk fbx format first, then use 3ds Max 2011 to create the VRML97 animation. However, Poser 8 does not support Autodesk fbx as export format, another intermediate software is required. DAZ studio 3⁵ has the function to directly import poser's pz3 file and export the animation as Autodesk fbx. Therefore, DAZ studio 3 is set to be the middleman.

3. FEASIBLE APPROACHES

3.1. Motionbuilder approach

There are four steps to let BVH to drive Motionbuilder figure. Figure 1 illustrate the approach in graph.

The first step is to import and characterise the BVH skeleton. In this step, a BVH motion file could be dragged and put into the scene, then click characterise the skeleton and set it to Biped character. The next step is to import a per-designed character model into the scene. The model is needed to be characterized as well. The characterize process would be to map different named parts of body to the bone name template, then the system could recognize them. The thirde step is to scale the size of the BVH skeleton to match the model. Movement in different size may cause wrong result. The forth step is to set BVH motion as the input motion of the model, then plot the character and export the model with motion in fdx format. After this approach has been done, the finally stage is import the fdx file into 3ds Max 2011 and export as VRML97. Figure 2 shows the result of Motionbuilder approach.

¹<http://www.web3d.org/x3d/>

²<http://poser.smithmicro.com/poser.html>

³<http://usa.autodesk.com/adsk/servlet/pc/index?id=13581855&siteID=123112>

⁴<http://usa.autodesk.com/3ds-max/>

⁵<http://www.daz3d.com/i/software/studio>

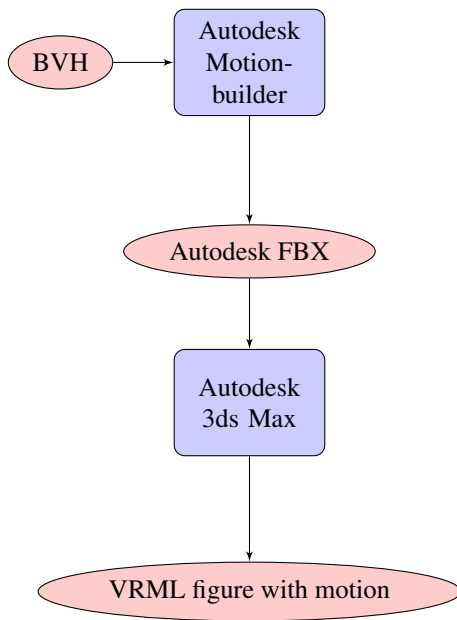


Figure 1: Flow chart of Motionbuilder approach

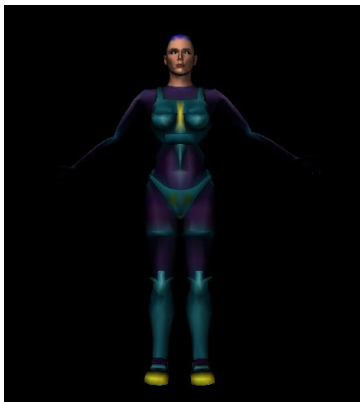


Figure 2: VRML figure produced by the Motionbuilder approach

3.2. Poser approach

To compare with Motionbuilder approach, the Poser approach is more problematic. The first try is to save the animation as pz3 file formation, then import into DAZ studio 3. However, the result of this method has an incorrect feet turning angle. Therefore, the BVH importing approach has been switched to DAZ studio 3. This solved the false movement problem. Figure 3 is the converting process. Figure 4 shows the result of the Poser approach.

Obviously, the figure is not properly textured. The issue will be discussed in the next section.

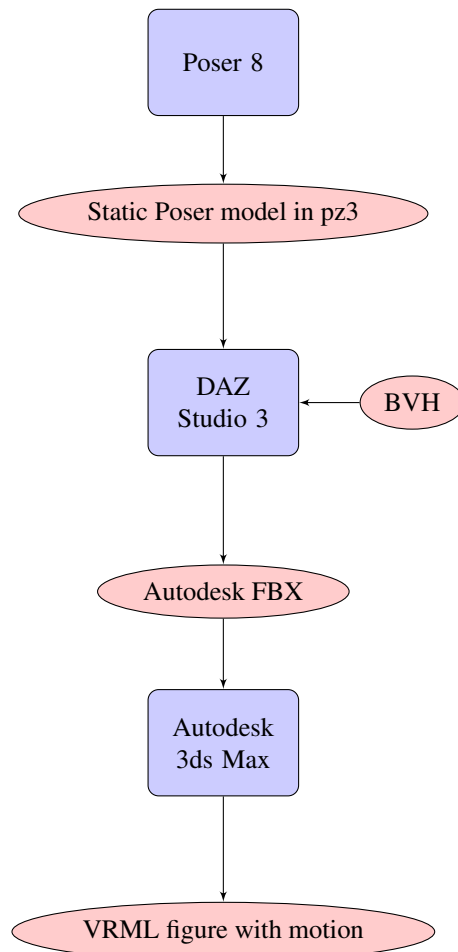


Figure 3: Flow chart of Poser approach

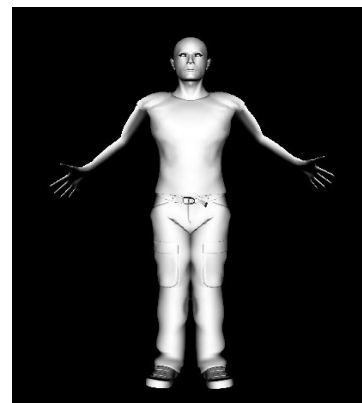


Figure 4: VRML figure produced by the Poser approach

4. ISSUES

Because the Motionbuilder approach provided a colorful and animated character, this section will be more focusing

on the texture problem of Poser approach. The untextured model is produced by directly exporting model from 3ds Max 2011 without computing. It is possible to let 3ds Max to export a colored model by computing the color per vertex. However, the model will be randomly mapped with color. Figure 5 demonstrate a wrongly colored model.

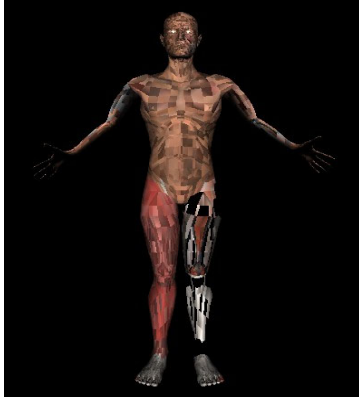


Figure 5: Incorrect colored figure

The possible reason for this might be the Poser model used texture node to color it. Textures can not be correctly mapped by 3ds Max. An attempt is to export figure with copying textures in to current folder. The result was not changed.

The other issue is converting VRML to X3D. Because human figure model contains large number of vertex and polygons, it is difficult to transfer it to X3D. Most of converting software will meet out of memory problem.

5. CONCLUSIONS

This report expounded two possible approaches to produce VRML character with animation. The Poser approach has unsolved color mapping problem. To find an approach to convert VRML to X3D is another issue which is needed to be solved.