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Group: Frozone

Personal Contributions:

1. **Project Management:**

Involved scheduling meetings, keeping everybody informed on what is going on and having a general overview of the remaining time. To be more efficient in planning and managing the project I set up an external website at http://lokalhorst.gotdns.org:8668/space/start. The website was developed using a Wikki which allowed all the group members to edit and upload new content by themselves. The software used can be downloaded at http://snipsnap.org/space/start

The website was split into different sections:

- **Schedule** - The time of completion for each shot.
- **Daily** - A section in which each team member stated his achievements of the day. Including time when not working on the project. (WebLog)
- **Meetings** - All meetings followed the same template: Attendees, Purpose, Agenda, Minutes, Issues, and Action Items.
- **Action Items** - Showing new, ongoing and closed action items.
- **Issues** - A place to remember issues encountered and the solution.
- **Research** - A section for us to upload reference images and reference content that was collected during the research phase.
- **Resources -** The content that we filtered from the research.
- **Group Members** - General Section with contact details, roles and responsibilities.
- **Initial Storyboard** - The initial storyboard
- **Shot Table** - Description of each shot including: In-, Out-, and total time. A short and detailed description of the shot as well as all the layers that make up the shot.
- **Pipeline** - Description of Software used in the project. Explanation of getting scene files between Maya and Houdini and an explanation of the project directory structure.

2. **Version Control**:

Involved administering, maintaining and setting up an external version control server using subversion (http://subverion.tigris.org). Installing the client software on the lab machines and making it accessible for all the group members. As the main interaction is through command line I installed a Gui interface to make it

easier for the other members to use. The use of a version control system allowed us to have the same directory structure for all members, which came into play when using our extensive referencing in the project files. In addition by using subversion we always had four backups of our project.

3. **Pipeline:**

Javier and I developed a directory structure to incorporate the need of each software package, the folders included are:

MayaGlobal - Included global mel scripts and renderData for MTOR/Renderman.

Test - The project environment for our testing phase. The folders in the directory are the same than a standard Maya project structure plus additional folders for Renderman and Houdini.

Production - The project environment for our production phase. Folders are the same than for Test.

FinalSequences - Included finalComp and finalRenders.

Scripts - The different Perl scripts developed during the project.

Documentation - Different reference pictures.

4. **Perl scripts**

During the phase of the project I have written different Perl scripts, which are explained in this section.

rename.pl - Rename files according to a given regular expression.

Shadowmaker.pl - As there is a bug when creating Shadows using SLIM, MTOR and RENDERMAN I had to write a script that manipulates the rib files that were created by MTOR in order to change the shadow from “Shadow” to “zfile” and to include the MakeShadow command in the end. The script also executed the final render.

ObjectInstancing.pl - In order to make the simulation of falling pieces Javier asked me to write a script that will use an exported rib file of a Maya particle simulation and to create a rib file per frame by substituting ObjectInstances of an additional specified file. It also created rotations and applied these per frame.

5. **Bash scripts**

The main bash scripts I have written for the project relate to rendering. The scripts were written for Renderman, Mantra, and Maya in order to execute renders manually to save the overhead of the running the actual application and to distribute Renders over all the machines in the lab when they were not in use by others!

6. **Mel scripts:**

ProjectSetup,mel. As we developed an extensive project directory setup I needed to write a mel script that resets all the Maya default project paths to

incorporate our directory structure. As the scale of our scenes were extremely large it additionally changed the default camera information in order to navigate efficiently within the scene.

OBJExport.mel:
For our simulations to work we needed to be able to export the active geometry plus animation from Maya to Houdini. As we used baked simulation files I wrote a script that exported a series of OBJ files only including the viewable geometry. This script also proved useful, as we needed the Maya geometry in Houdini to create the Ambient Occlusion passes.

BuildingDestructor.mel:
This script was developed in order to automate breaking on a large scale. The main problem when developing this script was the fact that the native Maya crack shatter script allows a division by 0, which throws an exception. To execute the script simply select the geometry and pass in the start time, the time of impact, the number of broken pieces, the collision layer, and the forces to act on the created pieces.

7. **Breaking simulation**

In order to make the simulation of the breaking buildings manageable I split up the breaking into separate layers for each building. Javier and I decided early on that the models should be modelled according to real world architecture. Therefore I modelled and broke the internal pillars, floors, walls, and the outer concrete. The main speed increase for the simulation was achieved through separating each piece into its own collision layer. This was even faster then assigning one rigid solver per piece. The approach was to simulate each layer, bake the simulation and the fine-tune it to make the interaction faster. In the end all the layers were combined to form the final building and to add the particle effects.

Furthermore I had to create the breaking of the right building in shot 08. As this shot was very close to the camera the animation of the mass and impact needed to be very accurate. The resulting outcome was achieved through a combination of key framing and dynamics.

8. **Modelling:**

I modelled the detailed model of all buildings for Shot04 and Shot08 including the internal structure. The main building was split up into internal pillars, internal walls and floors, external walls, window frames, and windows. I also had to remodel the main buildings for Shot07 and Shot09 to make the simulation of the breaking buildings more efficient.

Additionally I modelled the initial broken pieces for Shot08.