Animal Race Interactive a main field of study at the University of Introduction Results Introduction Digital-Media-Students at the University of Ulm have to choose a main field Animal Race of study in their advanced study period. At the moment there are several Download subjects to choose from: Making Of Gallery ONEngine - Interactive 3D-Animation - Interactive Systems - Video - Media-Psychology Development Development Blog On this website you see the results of Interactive 3D-Animation, which took Milestones three semesters from summer term 04 until summer term 05. What is ONEngine interactive 3D-Animation? Basically, as you can see, the project was to Documentation develop a 3D-Computer-Game, so you also could have called it AR Game Game-Development. There were 15 students and four tutors involved. Documentation Interactive 3D-Animation is a main field of study at the University of Ulm, Faculty for Computer-Science, Department Digital Media. People The project was the development of a 3D-Game with focus on characteranimation. Programmers Artists Here you can download the pdf-file from the final presentation of our game "Animal Race". Links & Special Thanks G3D ODE Animadead Angelscript

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# Animal

# Race

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Animal Race is a 3D racing game with some jump'n'run elements. The races take place in the microcosmic world of insects. Thus everyday objects like an shoe or an apple appear in gigantic size and the tracks lead lead around a puddle, across a sandbox or similar.

Every racer has its specialies:

The Beetle



The Ant



digs its way under some obstacles

Animal Race

can run very fast

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#### The Spider



can swing around some obstacles

The Hopper



The Locust



jumps over obstacles

jumps over obstacles

At some places of the tracks are obstacles wich can only be crossed by some of the insects and enable those to shortcut. For example the spider may be able to swing across an abyss the other insects cannot cross. Well, maybe the grashopper could jump over it, but the others would have to use a bridge. Various dynamic objects invite to play around with or block the path for the chasers.



There are also some bonus items placed on the track. The racers encounter rocket boost items, bad drugs which confuse the controls, honey pots to throw sticky beads in the way of their chasers and even herbal surprise eggs which can have any item hidden inside.



The featured levels are:

The Picnic Site





The track first leads across the blanket around picnic stuff like wine, bread and similar. This is followed by a long run through the lush neighbouring grassland.

#### The Junk Yard





A short run at the border of a junk yard, through sewers (featuring a rat) and basements.

The Meadow





Autumnal Meadow near a forrest with short grass and lots of flowers. There are lots of fir cones and chestnuts to play with. Watch out for the toy train!

At the Lake Side





A nice run around a puddle at springtime. Scenic landscape.

The Playground





A nice Sandbox with lots of toys and a fine track. Perfect for a quick run.

The Arena





Special Feature. The different animal types play a ball game against each other. They have to push the chestnut ball into one of the goals of the opposing teams to score.

Here are the pictures of a run through The Picnic Site:









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### Making Of

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<u>Gametest-Movie (21 MB)</u> <u>People at Work</u>



Animal Race is the result of the Interactive 3D-Animation course from summer term 04 to summer term 05. The first half of the 1.5 years 4 hours a week were spent on learning the necessary techniques for game development like modelling,

animating, skinning, OpenGL usage and so on.

Then a phase of brainstorming and concepting followed: severeal interesting game ideas were developed and discussed. Finally we decided on a very simple game that could be finished in reasonable time. More complex ideas like an action-real-timestrategy game with insects or an soccer-like game would probably be more fun to play but also much more difficult to finish.





In spring 05 the active work on the project started. Officially at least 4 hours a week should be spent on this, but all of us put a lot more work into it. Some nearly spent their full time on it while others had to attend their chosen lectures and got into full work in summer break. The team of 14 students was split into artists and programmers. Both groups were about the

same size, a few of us chose to help out in both groups.

Phase 1

While the programmers worked on the basics of the ONEngine, the artists started their work on the characters and random props.

So ... how to make an animated game character ? First step is a sketch. Then you use this sketch to get your digital 3D-model done. Add a skeleton, bind it and animate it. Paint a texture and talk to your



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programmers to get an appropriate material shader implemented. Export all data to the right file format.



Meanwhile ... The programmers decided to use the G3D, ODE, AngelScript and Animadead libraries as the base for the ONEngine. G3D because it provides a nice set on basic functionality, ODE for free physics, AngelScript for game play scripting and Animadead for skeletal animation because of its small amount of source code. Animadead was very young then and we ended up rewriting most routines but at least it was a starting point.

Apart from simple scene management functionality and the integration of the chosen libraries a basic GUI framework and an external level editor



were planned. Unfortunately the team lacked an appointed software engineer to continously plan and control the structure of the engine and thus some tasks were solved in quite other ways than the more seasoned programmers had planned. Engine (pdf) EntityCore (pdf) SceneCore (pdf) Network (pdf)

## Phase 2



When basic functionality was reached the modellers also had their first character ready and so first playable test games emerged.



At this point a project leader of sorts had emerged keeping track of the progress and assigning the most urgent tasks. Little time later it was necessary to appoint an artist taskmaster to organize this part of the work properly.



The artists continued to finish their characters, create props and level meshes and the programmers worked to get the level editor, networking and gui framework ready. The existing parts were augmented, changed



and fixed again and again. After all... there were quite some rookie programmers among us and none of us had ever finished an complete game engine with networking, physics, scripting...

At the same time quite some modellers struggled with the quirks of the modelling tool (Maya5) and scaling. The lack of an easy means to test their models in-game further hampered their efforts. Quite some time went in to the tweaking of the player character physics and steerage scripts. Sometimes it



looked more like an car race but finally we achieved decend player character steering.

### Phase 3

By the next step the level editor was useable and the GUI framework was put into real use for the game menus.







More content-rich levels were built by the artists and our angelscripter developed the necessary gameplay scripts. Some artists got outside on a sunny day to create lightprobes for the skyboxes or recorded sound effects. Apart from the usual work with augmenting and fixing the programmers created more visual effects and got the networking right.





networktest movie 21mb

## Finish

When not quite everything was running smoothly and the final deadline neared everybody put a lot of work (quite some night shifts) into the project during the final spurt. Shaders were written, textures refined, network prediction improved, menu screens cleaned up, lighting and fog fine tuned, scripts corrected, bugs fixed, and so on. The whole game got a more and more polished look while the code quality suffered ...







- Manuel Kugelmann - project leader of sorts ;)

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The ONEngine is based on the G3D Engine library. Other used libraries: ODE, Animadead, SDL, SDLMixer, AngelScript, skew.

Features:

- \* Dynamic Rigid Body Physics
- \* SoundFx and Music
- \* Mesh and Animation Loader
- \* Network Playing
- \* GUI Framework \* Scripting Host
- \* Resource Management
- \* XML-Levelformat
- \* Lightmap Generator
- \* Scene Management

#### \* ...

#### Graphics:

- \* Dynamic Soft Shadows
- \* Blended Detail Textures
- \* Various Material Shaders
- \* Skeletal Animated Meshes
- \* Direct and Indirect Lightingmaps
- \* Multiple Renderpaths
- \* Statechange Optimisation
- \* Frustum Culling \* ...
- \* Depth of Field Blur