Scenegraphs and Engines
Scenegraphs

- Application
- Scenegraph
- Windows/Linux
- OpenGL
- Hardware
Scenegraphs

- Choosing the right libraries is a difficult process
  - Very different target applications
  - Different capabilities
  - Underlying Graphics APIs

- Needs to fit the content pipeline
  - Important for application development
  - Not important for research (though convenient)
Choosing the right libraries is a difficult process

- Very different target applications
- Different capabilities
- Underlying Graphics APIs/Operating Systems

Needs to fit the content pipeline

- Important for application development
- Not important for research (though convenient)
We need:
- Content creation tools
- Exporters
- Scenegraph/Engine

 MechAssault 2 content pipeline
DCC tools

- Only “real” open source option: *Blender*
- Everything you need for Game/Movie production
  - Modelling/Rigging
  - Animation
  - Rendering/Compositing
- Contains complete game engine+editor
  - Fully integrated with UI
- Immense feature list causes steep learning curve!
Blender
Wings3D

- Easy to use subdivision surface modeller
Textures

- Gimp: Full featured image editing
Scenegraphs/Engines

- Scenegraphs deal with Rendering
- Engines deal with
  - Rendering
  - Physics
  - AI
  - Audio
  - Game logic
  - …
OpenScenegraph

- “Inofficial” Scenegraph of OpenGL
  - Implements OpenGL 2.0
  - Very clean design
  - Very high performance
  - High portability
  - Manipulators

- Targeted to
  - VR
  - Application
  - Visualisation
“Game” and Simulation-Engine, integrates
- OpenScenegraph
- OpenDynamics Engine
- Character Animation Library
- OpenAL (Audio)
- Game Networking Engine
- Tracker
- Editor
OGRE

- Commercial Grade Graphics Engine
  - Highly active community
  - Strong modular design
  - Bindings/Implementations in
    - C++, Java, C#, Python, Ruby
  - State of the art rendering
- Abstracts DirectX and OpenGL
- Combines with a lot of other libraries
  - Build your own game engine!
OGRE

- Countless tools/addons
- Very extensible
- “Higher order” render management
  - state management, spatial culling, dealing with transparency
- Proven, stable engine used in several commercial products
- Everything you need to make a computer game!
I will use OGRE example implementations throughout the course.

Pretty much everything in this course is implemented in OGRE and OGRE addons.

Very good way to play around with the course contents.

..without having to implement the basic algorithms.

www.ogre3d.org
### Scenegraphs

- **Open Source delivers many choices:**

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<tr>
<td>OpenScenegraph</td>
<td>Crystal Space</td>
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- **Many, many others…**

- **3D Engine Database/Search Engine:**
  - [http://www.devmaster.net/engines/](http://www.devmaster.net/engines/)
Tipps

- Learn one of the major DCC Programs
  - *Blender*, Maya, 3DSMax, Softimage XSI, Cinema4D, Lightwave
  - Takes time and is sometimes painful

- Learn one of the major scenegraphs/engines
  - Fast implementation of small projects
  - Reference Design/Implementation

- Choose software on
  - Previous knowledge/ Programming Language
  - Required features
  - Application content