ANAFOR

PROJECT INTERDIMENSION

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Agenda

- Overview
- Distinguishing Features & Solutions
- Data Creation
- Future Work
- Demonstration

Overview – Project Requirements

- 3D computer graphics
- Loadable multiple 3D scenes
- Game scripting
- Artificial intelligence for NPC
- Arcade components

Overview - Considerations

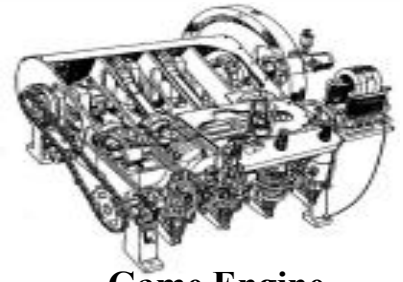
- Reliability
- Platform Independence
- Reproducibility
- Modularity
- Usability

Overview - Methodology

- Design Patterns
  - Abstract Factory
  - Adaptor
  - Mediator
  - Singleton
- MVC Paradigm
- Coding Standards

Distinguishing Features & Solutions

- Linux & Windows Support
- Extensible Engine with Generic Interfaces
- Logging System via Log4Cpp
- Two different collision systems simultaneously complementing each other: BSP Trees and ODE



Game Engine

- General Purpose Processor
  - •Registered event processing
  - •Handles queued job orders
  - •Three types of commands in an order: onEnter, onUpdate, onExit
- •Single interface BECommand: Examples are BESoundCommand, BEDoorDriverCommand, etc

Physics E

Data Res

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Input

Renderer

Sound System

Physics Engine

- Collision Processor
  - Provides feedback data and actions from physics engine
  - Physics events are registered and captured here
  - Collision Command inherits BECommand and is the ancestor of all physics commands
- Physics objects are initialized from XML files
- Simulation steps are checked by map collision
- The simulation deficiencies of ODE are corrected proactively

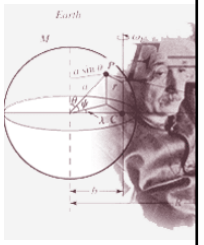
Input

Renderer

Sound System

Event Manager

- Synchronous and collaborative work between SDL Event Manager and AI Event Manager
- Base class BEController: Examples are Player Controller, Debug Controller, EscController, GUI Controller
- AI Events are retrieved, queued and dispatched to related agents in the AI Engine



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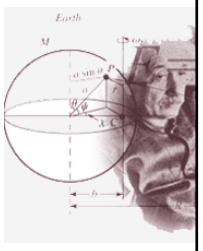
Script Engine



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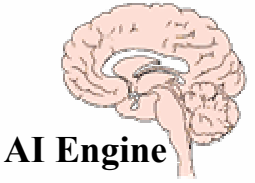
- Level data loading is done via level initialization scripts covering : Map, Models, Data Items, Characters, Doors, etc.
- AI Scripts initializes agents for NPCs
- AI States are loaded and set properly
- Callback function registering support
- Python Language is used for these purposes

Input

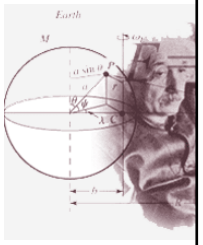
Renderer

Sound System



AI Engine

- Fully Script based initialization
- Hierarchical Finite State Machines to support the behavioral intelligence
- AStar Search algorithm is implemented and integrated
- Waypoint Graphs assist the searches
- Automated waypoint generation



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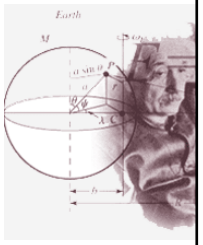

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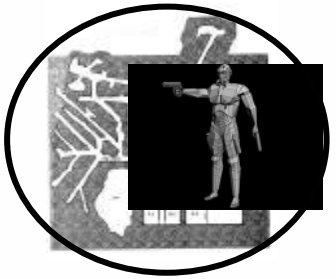

Data Resources

• Item Registries to identify each object from any point in the execution flow
•Animated MD3 Models
•BSP based maps
•GUI XML descriptions
•Physics XML descriptions
•Shader and configuration files for map and models

Data Res

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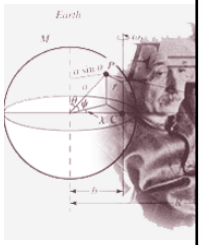
Character Engine



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Input

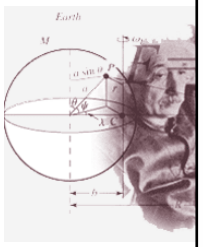
Renderer

Sound System

- Skeletal Animation
- Motion and Animation Blending
- High polygon characters
- Different Meshes for level of detail calculations that enhances performance during rendering
- Character Actuator and Perceiver

Camera Engine

- Single camera interface BECamera
- Implemented two cameras: BEOvershoulder and BEFreeCamera
- Wall avoidance for camera position



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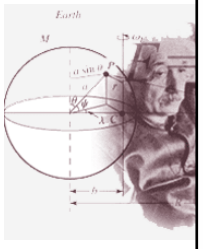
Sound System

Sound System

- Based on OpenAL
- Supports 3d sound positioning and sound levels
- Linux version uses threads
- Windows one has some programmer tricks



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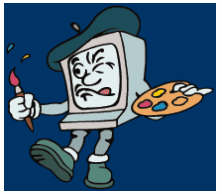
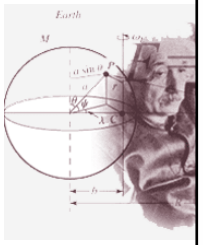


Renderer

- Render registry
- Video Rendering
- Multitexturing Support
- Reflections and Light Effects
- GUI Rendering
- Render content determination via clustering



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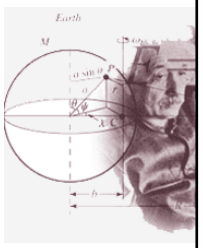
Input

- Keyboard and mouse inputs are directed to SDL Event Manager
- Game Console Support



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Data Creation

- Characters
  - *Poser*
  - *3D Studio Max R6*
- Map
  - *Gmax Tempest*
  - *GTK Radiant*
- Models
  - *3D Studio Max R6*
  - *Milkshape3D*
- Video
  - *Adobe Premier Pro 1.5*
  - *Adobe Audition*
- Texturing
  - *Adobe Photoshop*
  - *Gimp*

Future Work

- More Data Creation
  - Models
  - Characters and animations
  - Map enhancements
  - Sounds
- Testing
- Installation Package

Any Questions?