Example 3D Engine features

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Engine architecture

- Standard libraries
- Memory management
- Math libraries
- Base classes
- OpenGL ES 2.0 rendering (win32 & android)
- Support functionality
- Examples for win32 and android

Standard libraries

- Regular platform specific Standard Template Library is not used
  - Memory management
  - Availability
  - Slowness
- EASTL is used instead
  - Electronics Arts Standard Template Library
  - http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2007/n2271.html
  - https://github.com/paulhodge/EASTL

Memory management

- Separate memory allocators for different purposes
  - FreelistAllocator – like regular memory allocation
  - LinearAllocator – allocate many times, clear once
  - PoolAllocator – allocate objects of same size
  - StackAllocator – allocation and free must be done in correct order (stacking order)
- Global FreelistAllocator is used as default allocator, where memory allocations/frees are done by default
- Integrated to EASTL in way that EASTL uses default allocator for allocating/freeing memory

Math libraries

- slmath is used as math library
  - Portable
  - Stable and bug free
- https://code.google.com/p/slmath/

Core functionality

- Object –class to be used as base class of each Engine class
  - Object class supports “intrusive” reference counting
    - addRef
    - releaseRef
  - Overloaded new&delete operators so that custom memory management can be used.
- Ref –class for auto pointers
  - Ref stores the actual pointer to object and free’es it, if reference count of object goes to 0
- Platform independent logging functionality
- Platform independent file handling (FileStream)

OpenGL ES 2.0 rendering

- 2D texture support
- Shader
- Material (shader + textures + uniform values)
- VertexArray (positions or normals or colors etc.)
- VertexBuffer (positions+normals etc. data combined)
- IndexBuffer (for indexed meshed)
- Mesh (Vertex Buffer + IndexBuffer)
- Renderer (renders mesh with given material)
- Camera
- Light (point light example only)
- …

Support functionality

- Texture loading from file *.tga
- Mesh loading from file *.obj
- Animation support
  - Keyframe / KeyframeSequence
    - Step, LERP and SLERP interpolation methods
  - AnimationTimeline
    - Class for controlling animation time
  - AnimationTrack
    - For Proxy as setting animation target property
    - Animation blending

Examples for win32 and android

- Several examples, how to use engine ;)