

## Making Mobile Phone Games with Blender



By Gerhard Vökl



Gerhard Vökl, Blender Conference 2005, 14.10.2005

## How to Write Mobile Phone Games ? First Decision – C++ or Java



- C++
  - Different OS; Different API; low level OpenGL
- Java
  - Standard Java for Mobile Phones (J2ME)
  - Many Standard API (GUI, Communication ..)
  - Standard 3D API (JSR 184)

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## How to Write Mobile Phone Games ? What is JSR 184 ?



- Optional Java Package on Java Mobile Phones
- Defines all Objects of a 3D Scene Graph
- Should be easily implemented on OpenGL (for Phone Vendor)
- Defines own 3D File Format: \*.m3g

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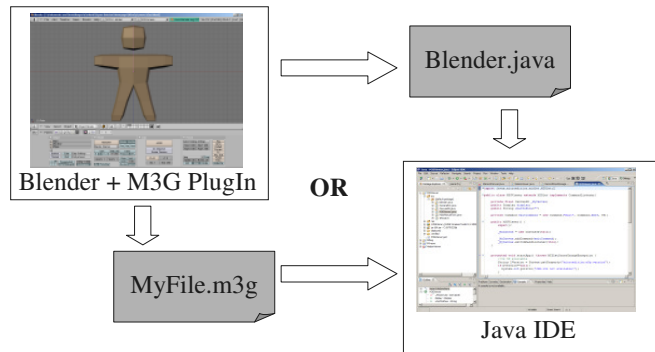
## How to Write Mobile Phone Games ? Tools for Developing with Java



- 3D Modeller: Blender (free)
- SDK: Sun Wireless Toolkit J2ME 2.0 (free)
- IDE: Eclipse (free)
- Testing: Phone Emulators for PC from different manufacturers (free)

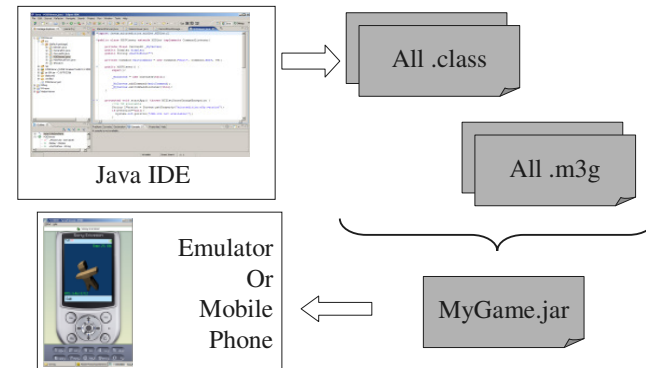
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## Development Pipeline Part 1



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## Development Pipeline Part 2



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## M3G – File Format Overview



- Very Compact Binary Format
- 3D Objects are serialized into File – Complete Scene Graph in File
- No Java Standard Serialisation
- Can be packed – Memory is important in Mobile Phones
- Part of API: Loader Class to load 3D Objects in Application available

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## M3G Blender Plug-In Features



- Tries to export complete Blender Scene
- Objects to be exported at the moment:
  - Camera
  - Material
  - Nmesh
  - Lamp
  - IPO
- 2 Options: Export M3G file or Java Source Code

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## M3G Blender Plug-In Under the Hood - 1



- Task: Translate **Blender Scene** into **M3G Scene Graph**

```
class M3GTranslator:
    def start(self):
        self.scene = Blender.Scene.GetCurrent()
        self.world = self.translateScene(self.scene)

    def translateScene(self, scene): ..
    def translateCamera(self, obj): ..
    def translateMaterials(self, aMaterial): ..
    def translateNMesh(self, obj): ..
    ..
```

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## M3G Blender Plug-In Under the Hood - 2



- For every M3G Class exists a Proxy Class

```
def translateCamera(self, obj):

    camera = obj.getData() #Blender Object

    myCamera = M3GCamera() #New M3G Proxy Object

    myCamera.near = camera.getClipStart() #Attributes
    myCamera.far = camera.getClipEnd()
    myCamera.name = camera.name

    self.world.children.append(myCamera) #Add to World
```

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## M3G Blender Plug-In Under the Hood - 3



- Writer Class tells Proxy: „Write Yourself“

```
class M3GCamera(M3GNode):

    def writeJava(self, aWriter, aCreate):
        aWriter.write(2, "//Camera " + self.name)
        aWriter.write(2, "Camera BL%i = new Camera();" ..

    def getData(self):
        data = M3GNode.getData(self)
        data += struct.pack("B", self.projectionType)
        return data

    def getDataLength(self):
        value += struct.calcsize("B") ..
```

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## Blender Plug-In: Next Versions



- Texture Support
- Bone Animation
- Back face Culling
- Parent – Child – Relationship
- ...

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## First Java Game Part 1



```
import javax.microedition.midlet.MIDlet;
import javax.microedition.lcdui.Display;
import javax.microedition.lcdui.game.GameCanvas;
import javax.microedition.m3g.*;

public class MyGame extends MIDlet {

    public void pauseApp() {}
    public void destroyApp(boolean b) {}

    public void startApp() {
        MyCanvas canvas = new MyCanvas(true);
        Display.getDisplay(this).setCurrent(canvas);
        try {canvas.run();} catch (Exception e) {}
    }
}
```

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## First Java Game Part 2



```
class MyCanvas extends GameCanvas {
    MyCanvas(boolean suppress){super(suppress);}

    public void run() throws Exception {
        Graphics3D g3d = Graphics3D.getInstance();
        World w = (World) Loader.load("/file.m3g")[0];
        long start, elapsed, time = 0;
        while (getKeyStates() == 0) {
            start = System.currentTimeMillis();
            g3d.bindTarget(getGraphics());
            try {
                w.animate(time);
                g3d.render(w);
            } finally { g3d.releaseTarget(); }
            flushGraphics();
            elapsed = System.currentTimeMillis()-start;
            time += (elapsed < 100) ? 100 : (int)elapsed;
            if (elapsed < 100) Thread.sleep(100-elapsed);}}
}
```

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## Thank You for your Interest Questions ?



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## Links



- M3G Plug-In : [www.nelson-games.de/bl2m3g/](http://www.nelson-games.de/bl2m3g/)
- SDK: [java.sun.com/j2me/](http://java.sun.com/j2me/)
- Eclipse: [www.eclipse.org](http://www.eclipse.org)
- Different Emulators: Search Google
- The Java Midlet was inspired by a JavaOne Presentation by Tomi Aarnio, Kari Pulli

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