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Writing Fantastic Arcade Games with JavaFX SDK 1.0

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JAVAFX: COLLISIONS, TIMELINES AND ANIMATIONS WITH PROJECT GOLIATH



Rich Media Programming

- First Edition of the JavaFX Platform
- JavaFX Script Statically Compiled Programming Language (SDK)
- JavaFX Runtime for Desktop RIA
- Java Media Component API: Capability for Video and Audio Playback
- Java 6 update 10 JDK / JRE



Game Systems, Ye Olde

- Sequential Game Loop
- Nested Do ... Until loop with state
- Largely procedural calls
- Management of state
 - Number of lives
 - Number of aliens
 - Energy Level
 - Wave of bombers

The Central Node

- `GameObject.fx`
- Define the Cartesian coordinates
- Boundaries of the object for a collisions
- Returns JavaFX SceneGraph Object
 - `ImageView` (PNG, JPG, GIF)
- Add Transformation
- Add Internal Animation Frame Timeline for Winking Eyes, Arms and Legs
- Intersection and touching between other reference `GameObjects`.
- Start and Stop animations

World of Game Objects

- Sub classes of `GameObject.fx` include
 - `Friend.fx`
 - `Neutral.fx`
 - `Alien.fx`
- Game Objects stored in the Game Control mechanism
- SceneGraph nodes of the Game Objects are dynamically added and remove from a Canvas node.

Deterministic Animation

- Moving GameObjects around your scene. JavaFX animation with timelines
 - Especially nice to research JavaFX 1.0 path transitions
 - Work with an intelligent designer to define Illustrator paths
- Compute yourself the paths
 - Can't afford to buy Photoshop CS3/4, Pen and Pad
 - Project Goliath Preview SDK
 - More programmatic control of *swooping* Aliens

The JavaFX “Threads” Get-Out Clause

```
var collisionTimeline: Timeline = Timeline {
    repeatCount: Timeline.INDEFINITE
    keyFrames : [
        KeyFrame {
            time: 20ms;
            action: function(): Void {
                collisionAnalysis();
            }
        },
    ]
};

collisionTimeline.play();
```

The Animation Thread

```
var animationTimeline: Timeline = Timeline {
    repeatCount: Timeline.INDEFINITE
    keyFrames : [
        KeyFrame {
            time: 20ms;
            action: function(): Void {
                performAnimation();
            }
        },
    ]
};
animationTimeline.play();
```

Two Essential JavaFX Sequences

- Scene Graph Nodes on the Scene
 - Sequence of Nodes, which are returned from `GameObject`, which Post-init constructed)
 - `insert BugDrone.createNode() as GameObject into Scene.content`
- Game control registry of `GameObject`
 - `GameObject` list of the world
 - `GameObject` list of fired missiles
 - `GameObject` list of dropped bomblets

Collision Handling

- Caution that this does not become an $O(N^2)$ operation!
- Destruction of GameObjects means
 - Removal associated Node from the SceneGraph
 - Removal object from the Game Control
- Insertion
 - Insert the Explosion into Game Control
 - Insert the Explosion's Node into SceneGraph

We Need A Timer-Based Deferred Task?

- JavaFX supports closures, lexically scope variables! Wow!
- DeferredTask executes immediately on the Event Dispatch Thread.
- In a collision we could the explosion between two object, then we can have TimerTask in closure that closes it down 1.5secs later!

DEMO

Project Goliath Demos





Summary

- Rich Media on Java Platform finally here
- JavaFX Timelines make animations and games really easy
- Non-deterministic timelines are the secret sauce
- Unbelievably strong handling, binding and triggering with hundreds of separate game object is really possible.
- Roll on JavaFX 1.1 and **Beyond!**



Thanks for your attention!

- http://jroller.com/peter_pilgrim
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 - peter.pilgrim@gmail.com
 - Project Goliath Blog
 - BBC Micro Soundkit
 - Graphics
 - Video
- 