UI Composer™: NVIDIA’s New 3D UI Suite

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Introducing UI Composer

- Background
- Reality
- Pillars of UX Design
- UI Composer
- Examples
- Large Scale Development
- Conclusion & Q&A
Background

• NVIDIA acquired Anark Gameface, a multi-media authoring tool that seamlessly composites 2D, 3D, Text, Video and Audio
• Anark Gameface has been shipping to AAA game development studios worldwide since 2004
• Thousands of users
• PC, XBox360, PS3 and NOW Tegra (APX2500)!
• UI Composer is Anark Gameface redesigned for embedded devices
Reality

• The iPhone has set the bar for User Experience (not just UI!)
• 3D has much higher visual effect (shaders)
• 3D can be hard and expensive to create
• It can be difficult to find resources with 3D experience
• Need to deliver on short timelines
• UI Composer addresses these issues (and more!)
Pillars of User Experience Design

- Designing a user experience is analogous to constructing a building

Workflow: foundation, layout, floor plan, navigation through house, architectural diagram

Design: what will it look like? feel like? what are the interactions?

Build: crafting, constructing, putting up walls, laying the tile, validating workflow and usability
Workflow

- Who is the homeowner? What are their needs? (Who will be using the application)?
- Is this a business? Home? Library? Hospital? This will determine needs/usage patterns. (Is this application designed for entertainment, business, medical, home use)?
- What are the goals (to entertain, inform, usability, safety)?
- What sort of foundation will make people successful?
- **UI Composer** allows you to plan and design the foundation, layout, floor plan and navigation of your application.
Design

- **UI Composer Studio** aids in designing the aesthetic, the style, the “furniture”, “carpet” and “drapes” of your application.

- **Form follows function**
  - Functionality allows you to get from A to B, but is this enough?
  - Take the iPhone for example, functional - sure, but the form provides the WOW factor!
  - Form engages users, makes them want to use the application, to be involved. This is how Apple attracts and retains loyal customers.

"It is the pervading law of all things organic and inorganic, 
Of all things physical and metaphysical, 
Of all things human and all things super-human, 
Of all true manifestations of the head, 
Of the heart, of the soul, 
That the life is recognizable in its expression, 
That form ever follows function. This is the law."

What is Designer Driven Workflow?

- Designer in the driver’s seat
  - Classically, programmer controls interactivity
  - Typically, internal UI teams are “gated” by programmers
- “WYSIWIG” is ideal
  - “What you see is what you get”
  - Authoring environment specifically suited for artistic flow
- High speed iterating
  - 2D & 3D user interfaces are complex to describe
  - Prototyping & revisions
  - Artists need to cycle on concepts
- Best results - least time
  - Remove obstacles to creative flow
  - Connect testing closely to creation - “test early”
Designer Driven Workflow

**Traditional: Programmer Driven (Long Development Cycles)**

- Artist: Photoshop Mockup
- Programmer: Prototype (Weeks)
- Designer: More Changes
- Programmer: Changes (Days)

*Slow Iterations*

**UI Composer: Designer Driven (Rapid Development Cycles)**

- Artist/Designer: UI Composer
- Application: Real-time Changes

*Immediate Iterations*

Platform integration done once

Enables real-time prototyping, tuning and refinement
Crafting the application = Coding, Integrating, Testing, Debugging, Profiling

Using standard Development Tools (Visual Studio, gcc, etc)

Platform specific conditioners and optimizers (Tegra)

UI Composer Analyzer for debugging and profiling

UI Composer Simulator for artists and designers

NVIDIA PerfHUD and other tools for profiling

Documentation and Examples
What is UI Composer?

- Suite of tools, runtime libraries, documentation and support to enable designer driven development of compelling user experiences
UI Composer Studio

“Slides” Modular organization of large projects – like PowerPoint “Master” Slides

“Timeline” Accurately define animation key frames similar to After Effects or Flash

“3D View” Live WYSIWYG, real-time view of UI - sophisticated 3D composition tools

“Asset Library” Access to reusable components. Organize commonly used assets.

“Inspector” Control fine details of presentation data Create artist-friendly interactivity (Action/Events) Animate any value

Workflow

Design

Build
UI Composer Toolchain

**Dynamic Data**
Examples: Speed, Temperature, Fuel Consumption, Media, Weather, Stocks

**Skinning**
Rebrand, repurpose or reuse content
Examples: 3D Models, Textures, Colors

**Multi-resolution**
Repurpose content for multiple resolutions devices, orientation changes

**Future Features:**
Post-effects
Drag and Drop Animations
Built-in Gesture Support
Transitions
Flow Control

**Layout/Alignment**
Containment controls: Stack, Flow, Grids

**Workflow**

- Design
- Build
UI Composer Runtime

- Lightweight C++ codebase
- Proven in the field
- Embed into any application to provide UI Composer playback
- Built on UI Fusion framework
- Strong memory management
Example

- Automotive HMI with Interactivity
Large Scale Development

• Next Generation UIs can be very large
  • Dozens of screens and controls
  • Must establish common, reusable control set

• Components/Templates
  • Self contained
  • Re-usable
  • Time independent
  • Interactive

• Component change management
  • Update all components across all screens

• Automation
  • Command line control of authoring environment
Documentation and Support

- World Class Application with Training Videos, Tutorials, User Manuals, Examples
- Frequent updates
- Agile roadmap
- DevTech++
Conclusion & Q&A

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• Questions?