

## Leveraging Flex 2 and Flash Player 9 for Truly Cinematic Experiences

Alex Uhlmann  
Consultant  
Adobe Consulting EMEA



2006 Adobe Systems Incorporated. All Rights Reserved. 1

### About Me – Alex Uhlmann

- Study of Business Information Systems in Lueneburg, Germany and Edinburgh.
- Self employed developing Flash RIA's.
- AnimationPackage
  - <http://www.alex-uhlmann.de/flash/animationpackage>
- Internship at iteration::two
- Joined Macromedia Consulting EMEA
- Joined Adobe Consulting EMEA (Consultant)

2006 Adobe Systems Incorporated. All Rights Reserved. 2

### Aim of the Next 60 Minutes

- Demonstrate some cool effects !
- Show you how they were achieved with Flex
- Help you incorporate them into your own applications

2006 Adobe Systems Incorporated. All Rights Reserved. 3

### Overview

- Applying Effects to Rich Internet Applications
- Case Study – The “Flip Effect”
- Using and Creating your own Advanced Effects
- A Look to the Future

2006 Adobe Systems Incorporated. All Rights Reserved. 4

## Applying Effects to Rich Internet Applications

- How are effects important to RIA ?
- What does Flex 2 change for Effects ?



2006 Adobe Systems Incorporated. All Rights Reserved. 5

### How Are Effects Important to Your RIA

- Effects can help with the “feel” in a look and feel
- Responsible use of effects assists the user-experience
  - Directive Affordance – using movement to manage attention
  - Progressive Reveal / Disclosure in complex user-interfaces
- Match desktop-expectations in a web-deployed app
- Warning – use only under the supervision of UX !!!
  - **Otherwise, we are just inventing the new “blink” tag**

2006 Adobe Systems Incorporated. All Rights Reserved. 6

### What Does Flex 2 Change for Effects? MAX

- Flash Player 9
  - Performance
  - Bitmap manipulation features
- Flex 2 Effects Framework
  - General quality and feature coverage.
  - Extensibility
  - States and Transitions

2006 Adobe Systems Incorporated. All Rights Reserved. 7

### Case Study – “The Flip Effect” MAX




2006 Adobe Systems Incorporated. All Rights Reserved. 8

### UI Metaphor - Flipping Things Around MAX

- Many real world analogies
  - User's like to “flip something over” to tinker with it – configuration options
  - A nice means of capitalising on real-estate – shopping cart / checkout
- Easy to understand
  - User's expectation is that it's easy to “flip back again”
  - Helps user retain context of where they were, where they are
- Increasing use in desktop applications
  - Windows Vista
  - Sun Looking Glass

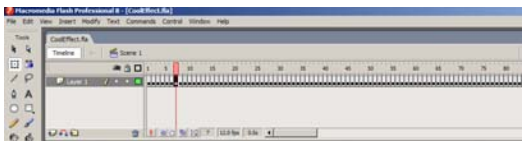
2006 Adobe Systems Incorporated. All Rights Reserved. 9

### Flip Effect MAX

- I've created a demo application that showcases the flip effect
 
- I'll now speak about concept behind the simple Flip effect in more detail...

2006 Adobe Systems Incorporated. All Rights Reserved. 10


### Flip Implementation Approach MAX

- Design Time With Flash
 

2006 Adobe Systems Incorporated. All Rights Reserved. 11

### Flip Implementation Approach MAX

- Runtime Old Approach
  - Cheat on the flip by just squeezing and expanding the image
  - <http://www.richinternetapps.com/archives/000108.html>



| Name               | Qty | Price           | Tax     | Sub | Tot      |
|--------------------|-----|-----------------|---------|-----|----------|
| USB Watch          | 1   | \$100.00        | \$10.00 | 1   | \$110.00 |
| 007 Digital Camera | 1   | \$100.00        | \$10.00 | 1   | \$110.00 |
| 2-Way Radio Watch  | 1   | \$50.00         | \$5.00  | 1   | \$55.00  |
| Checkout           |     | Total: \$270.00 |         |     |          |

2006 Adobe Systems Incorporated. All Rights Reserved. 12

### Flip Implementation Approach

- Runtime New Approach
- Don't cheat – actually distort the image to achieve true perspective
- Use Flash Player 8 bitmap features to achieve this

2006 Adobe Systems Incorporated. All Rights Reserved. 13


### Distortion Implementation Approach

- There are 2 different approaches
  - Using Displacement Maps – using Flash filter classes
  - Using a Skewing algorithm
- I will follow the Skewing algorithm approach
  - “Simplest thing that could possibly work”


2006 Adobe Systems Incorporated. All Rights Reserved. 14

### Skewing


- Skewing is achieved with Transform Matrix
  - The actual class is flash.geom.Transform
- The kind of transformations this enables are:
 



Original



Yes




No
- The second example “No” is closer to our desired Flip effect
  - But it isn't possible with Transform Matrix
  - One solution is to use “triangular tessellations”

2006 Adobe Systems Incorporated. All Rights Reserved. 15

### Triangular Tessellations

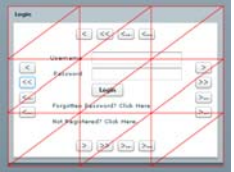
- Capture the entire area to flip as a bitmap
  - This leverages the Flash Player's vector renderer



2006 Adobe Systems Incorporated. All Rights Reserved. 16

### Triangular Tessellations


- Capture the entire area to flip as a bitmap
  - This leverages the Flash Player's vector renderer
- Redraw the bitmap as a tile of triangles
  - This leverages the Flash Player's beginBitmapFill method of flash.display.Graphics



2006 Adobe Systems Incorporated. All Rights Reserved. 17

### How to Freely Transform Display Objects

- Then achieve the flip effect by matrix manipulation of each of the triangular tiles

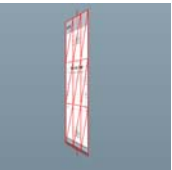


2006 Adobe Systems Incorporated. All Rights Reserved. 18

### How to Freely Transform Display Objects

MAX

- Then achieve the flip effect by matrix manipulation of each of the triangular tiles
- Later, you'll see how there are Flex classes you can use to manage all this algorithm for you.



2006 Adobe Systems Incorporated. All Rights Reserved. 19

### How to Freely Transform Display Objects

MAX

- Leveraged the Sandy open-source 3D project
  - Created by Thomas Pfeiffer
  - Looking for Contributors
  - <http://flashesandy.org>
- In my code, I make use of `sandy.util.DistortImage`



2006 Adobe Systems Incorporated. All Rights Reserved. 20

### Using and Creating Your Own Advanced Effects




2006 Adobe Systems Incorporated. All Rights Reserved. 21

### Example Effects

MAX

- I've created several effects as examples of applying distortion
  - Flip
  - CubeRotate
  - Push
  - Pop
  - Door
  - Gate
- I've created a demo application that showcases all distortion effects



2006 Adobe Systems Incorporated. All Rights Reserved. 22

### Example Effects

MAX

- The API is very similar for all these effects:
 

```

var instance : Flip = new Flip ( currentView );
instance.siblings = [ newView ];
instance.direction = DistortionConstants.TOP;
instance.smooth = true;
instance.buildMode = DistortionConstants.REPLACE;
instance.distortion = 25;
instance.liveUpdate = false;
instance.liveUpdateInterval = 5;
instance.blur = new Blur( 0, 20 );
instance.duration = 500;
instance.easingFunction = Sine.easeInOut;
instance.addEventListener( EffectEvent.EFFECT_END, onEnd );
instance.play();

```

2006 Adobe Systems Incorporated. All Rights Reserved. 23

### Example Effects

MAX

- The API is very similar for all these effects:
 

```

var instance : CubeRotate = new CubeRotate( currentView );
instance.siblings = [ newView ];
instance.direction = DistortionConstants.TOP;
instance.smooth = true;
instance.buildMode = DistortionConstants.REPLACE;
instance.distortion = 25;
instance.liveUpdate = false;
instance.liveUpdateInterval = 5;
instance.blur = new Blur( 0, 20 );
instance.duration = 500;
instance.easingFunction = Sine.easeInOut;
instance.addEventListener( EffectEvent.EFFECT_END, onEnd );
instance.play();

```

2006 Adobe Systems Incorporated. All Rights Reserved. 24

### Example Effects

- The API is very similar for all these effects:
- var instance : Push = new Push ( currentView );
- instance.siblings = [ newView ];
- instance.direction = DistortionConstants.TOP;
- instance.smooth = true;
- instance.buildMode = DistortionConstants.REPLACE;
- instance.distortion = 25;
- instance.liveUpdate = false;
- instance.liveUpdateInterval = 5;
- instance.blur = new Blur( 0, 20 );
- instance.duration = 500;
- instance.easingFunction = Sine.easeInOut;
- instance.addEventListener( EffectEvent.EFFECT\_END, onEnd );
- instance.play();

2006 Adobe Systems Incorporated. All Rights Reserved. 25

### Example Effects

- The API is very similar for all these effects:
- var instance : Pop = new Pop ( currentView );
- instance.siblings = [ newView ];
- instance.direction = DistortionConstants.TOP;
- instance.smooth = true;
- instance.buildMode = DistortionConstants.REPLACE;
- instance.distortion = 25;
- instance.liveUpdate = false;
- instance.liveUpdateInterval = 5;
- instance.blur = new Blur( 0, 20 );
- instance.duration = 500;
- instance.easingFunction = Sine.easeInOut;
- instance.addEventListener( EffectEvent.EFFECT\_END, onEnd );
- instance.play();

2006 Adobe Systems Incorporated. All Rights Reserved. 26

### Example Effects

- The API is very similar for all these effects:
- var instance : Door = new Door ( currentView );
- instance.siblings = [ newView ];
- instance.direction = DistortionConstants.TOP;
- instance.smooth = true;
- instance.buildMode = DistortionConstants.REPLACE;
- instance.distortion = 25;
- instance.liveUpdate = false;
- instance.liveUpdateInterval = 5;
- instance.blur = new Blur( 0, 20 );
- instance.duration = 500;
- instance.easingFunction = Sine.easeInOut;
- instance.addEventListener( EffectEvent.EFFECT\_END, onEnd );
- instance.play();

2006 Adobe Systems Incorporated. All Rights Reserved. 27

### Example Effects

- The API is very similar for all these effects:
- var instance : Gate = new Gate ( currentView );
- instance.siblings = [ newView ];
- instance.direction = DistortionConstants.TOP;
- instance.smooth = true;
- instance.buildMode = DistortionConstants.REPLACE;
- instance.distortion = 25;
- instance.liveUpdate = false;
- instance.liveUpdateInterval = 5;
- instance.blur = new Blur( 0, 20 );
- instance.duration = 500;
- instance.easingFunction = Sine.easeInOut;
- instance.addEventListener( EffectEvent.EFFECT\_END, onEnd );
- instance.play();

2006 Adobe Systems Incorporated. All Rights Reserved. 28

### Using the Distortion Class

- Created a Distortion effect for Flex
- Builds upon the open-source Sandy project's DistortImage
- Class is com.adobe.ac.mxeffects.Distortion
- SimpleDistortion can be used for non Flex Framework environments
- Presents an easy-to-use API for Flex Distortions
  - Allows to manipulate sides (left, right, top, bottom) or points
  - Works with percentage or pixel values
  - Offers common used convenience methods such as flip, pop, push, etc.
- Manages original vector display object
  - Ensure that effects "play nicely" over the underlying screen
  - Allows to replace, add, overwrite or cover against the original display object

2006 Adobe Systems Incorporated. All Rights Reserved. 29

### Managing Original Vector Display Object

- Replace Mode swaps both display objects around

```

graph TD
    subgraph Before
        C1[Container] --- V[Vector]
    end
    subgraph After
        C2[Container] --- B[Bitmap]
    end
    C1 --> C2
  
```

The diagram illustrates the 'Replace Mode' where a 'Container' originally containing a 'Vector' display object is transformed into a 'Container' containing a 'Bitmap' display object. A green arrow points from the initial state to the final state.

2006 Adobe Systems Incorporated. All Rights Reserved. 30

### Managing Original Vector Display Object

- Add Mode adds the new bitmap alongside the vector

2004 Adobe Systems Incorporated. All Rights Reserved. 31

### Managing Original Vector Display Object

- Overwrite Mode writes the distortion into the graphics property of the vector

2004 Adobe Systems Incorporated. All Rights Reserved. 32

### Managing Original Vector Display Object

- Popup Mode hides the vector and creates a popup above it

2004 Adobe Systems Incorporated. All Rights Reserved. 33

### Utilities for Managing Applied Filters

- `com.adobe.ac.util.DisplayObjectBoundsUtil` helps in calculation of bounds on effects
- `SimpleDisplayObjectBoundsUtil` can be used for non Flex Framework environments

2004 Adobe Systems Incorporated. All Rights Reserved. 34

### Using Distortion Explorer

- Helps you to precisely achieve the distortions you want.

2004 Adobe Systems Incorporated. All Rights Reserved. 35

### A Look to the Future

2004 Adobe Systems Incorporated. All Rights Reserved. 36


## Effects in Other Technologies MAX

- Many other UI technologies are leveraging effects to deliver enhanced user-experiences
  - Sun Looking Glass
  - Mac OSX
  - Windows Vista
- We can look to these technologies for inspiration as to how to apply effects
- But we should listen to our UX team most of all!

2006 Adobe Systems Incorporated. All Rights Reserved. 27

## Pushing Flex 2 Further MAX

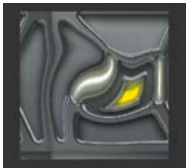
- A number of ways I'm looking at further capabilities
- Using Distortion in UI Components
- Proof of Concept "3D View Stack" and "3D Skins"



2006 Adobe Systems Incorporated. All Rights Reserved. 28

## Pushing Flex 2 Further MAX


- Exploiting the DisplacementMapFilter
- A filter that can apply displacements in real-time
- Can enable us to create more "liquid" effects



- <http://lab.andre-michelle.com/>

2006 Adobe Systems Incorporated. All Rights Reserved. 29


## Future of AnimationPackage MAX



- <http://www.alex-uhmann.de/flash/animationpackage/>
  - AnimationPackage 1 (Flash Player 6, Flash Lite 2)
  - AnimationPackage 2 (Flash Player 8)
  - AnimationPackage 3 Alpha (Flash Player 9)
- Will stay Flex Framework independent
- Keep an eye on my blog for updates on this and future Flex effects

2006 Adobe Systems Incorporated. All Rights Reserved. 40

## Summary



2006 Adobe Systems Incorporated. All Rights Reserved. 41

## Summary MAX

- Responsible use of effects can greatly enhance the quality of user-experience
- Flex 2 becomes an enabling technology for delivery of truly cinematic effects
- Deep dive into "The Flip Effect"
  - Explored algorithm using distortions, skewings and tessellations
  - Showed how the algorithm can be implemented within the Flex APIs
- Discussed how you can think about creating your own effects
  - Start from my Distortion class that is built upon the work of Thomas Pfeiffer's Sandy Project
  - A number of APIs that have been developed within EMEA RIA Practice for Effects
- Look to the next generation of desktop applications, as well as to the leadership of our own UX team, for how to apply these effects

2006 Adobe Systems Incorporated. All Rights Reserved. 42

## Further Information



- Download Source Files and Examples:  
<http://weblogs.macromedia.com/auhmann/archives/DistortionEffects.zip>
- Sandy 3D Library  
<http://flashsandy.org>
- Follow up with the Flash Community
  - <http://weblogs.macromedia.com/mxna/>CategoryFlash>
  - Andre Michelle's Experiments <http://lab.andre-michelle.com/>
- Sun's Looking Glass project
  - [http://www.linuxdevcenter.com/pub/a/linux/2005/12/08/project\\_looking\\_glass.html?page=1#](http://www.linuxdevcenter.com/pub/a/linux/2005/12/08/project_looking_glass.html?page=1#)
- Adobe Flex Documentation (i.e. Creating and Extending Flex Components, Chapter 15 Creating Effects)
- Or email me at [auhmann@adobe.com](mailto:auhmann@adobe.com)
- My blog: <http://weblogs.macromedia.com/auhmann/>



Better by Adobe.™

