

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

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### 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)

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### 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

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### Overview

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

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## Applying Effects to Rich Internet Applications

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



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### 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**

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### 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

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




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### 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

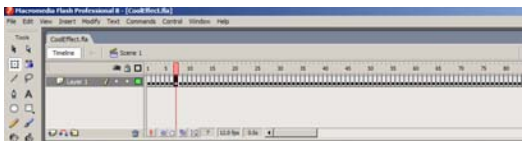
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### Flip Effect MAX

- 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...

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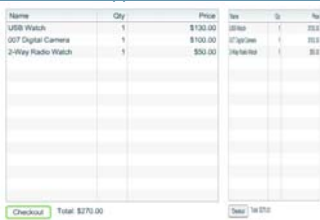
### Flip Implementation Approach MAX

- Design Time With Flash
 

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### 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	Tot	Unit
USB Watch	1	\$100.00	\$10.00	110.00	\$10.00
007 Digital Camera	1	\$100.00	\$10.00	110.00	\$10.00
2-Way Radio Watch	1	\$50.00	\$5.00	55.00	\$5.00
<b>Checkout</b>		<b>Total:</b>	<b>\$270.00</b>		

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### 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

### 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”

### 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”

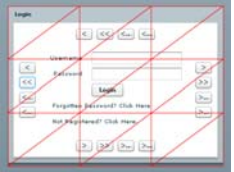
### Triangular Tessellations

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




### 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



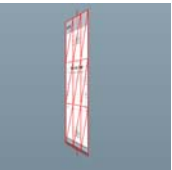
### How to Freely Transform Display Objects

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



### How to Freely Transform Display Objects

- 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.



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### How to Freely Transform Display Objects

- 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`



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## Using and Creating Your Own Advanced Effects



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### Example Effects

- 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



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### Example Effects

- 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();

```

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### Example Effects

- 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();

```

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### 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();

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### 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();

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### 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();

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### 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();

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### 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

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### Managing Original Vector Display Object

- Replace Mode swaps both display objects around

The diagram illustrates the 'Replace Mode' process. On the left, a green rounded rectangle labeled 'Container' has a vertical line connecting it to another green rounded rectangle labeled 'Vector'. A green arrow points to the right, where the same 'Container' is shown, but the vertical line now connects it to a green rounded rectangle labeled 'Bitmap', indicating that the original vector object has been replaced by a bitmap.

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### Managing Original Vector Display Object

MAX

- Add Mode adds the new bitmap alongside the vector

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### Managing Original Vector Display Object

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

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### Managing Original Vector Display Object

MAX

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

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### Utilities for Managing Applied Filters

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

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### Using Distortion Explorer

MAX

- Helps you to precisely achieve the distortions you want.

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### A Look to the Future

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## 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!

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## Pushing Flex 2 Further MAX

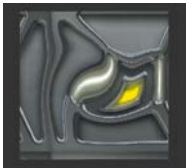
- A number of ways I'm looking at further capabilities
- Using Distortion in UI Components
- Proof of Concept "3D View Stack" and "3D Skins"



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## 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/>

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## 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

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## Summary



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## 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

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## Further Information



- Download Source Files and Examples:  
<http://weblogs.macromedia.com/auhmann/archives/DistortionEffects.zip>
- Sandy 3D Library  
<http://flash.sandy.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/>



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