

# Up Up and Away3d

An Introduction to Flash  
3D Using Away3D



# Who Am I

**Theo E Rushin Jr**

Windows-based Developer – Since '85

ColdFusion Developer – Since '99

Technical Instructor – Since '85

Flash Developer – Since '99

Flex Developer – Since '05

Deploying Flex application to AIR Since '07

*Christian, Snowboarder, Paintballer, Magician,*

...



# Agenda

- Step into 3D
- The View, the Scene, and the Camera
- Primitives on Parade
- Enter Away3D
- From 0 to 3D in 10
- Movement and Interactivity
- Example Code Review
- QnA



STEP INTO 3D



# Step into 3D

2D Graphics use a two (2) axis coordinate system ... x and y

3D graphics use a three (3) axis coordinate system ... x, y, and z

*So tell me something I don't already know*



# Step into 3D

*Did you know? ....*

- A point in 3D space is called vertex.
- A triangle is the smallest possible 3D object that can be drawn.
- A triangle is made of three vertices, often referred to as faces.
- They are only visible from one side.



# Step into 3D

Many (sometimes hundreds) triangles may be required in order to represent any kind of 3D complex model.

The more triangles used in drawing the model the smoother the model appears and more processing power is needed.



# Step into 3D

Although you can draw your own triangles and create 3D models from scratch, 3D modeling software can be used to ease the complexity of creating interactive 3D models.





ENTER AWAY3D



# Enter Away3D

Away 3D is a free, open source, Actionscript, 3D engine for Flash development.

<http://away3d.com/>

Similar frameworks include: Papervision, Sandy3D, etc.





# THE VIEW, THE SCENE, AND THE CAMERA



# The View, the Scene, and the Camera

- The View is a rectangular area (a “window”) through which we can view the 3D scene.
- By default, the View takes up the entire width and height of the Flash movie.
- By default, the View is not cropped.
- Each View contains a default scene and camera.



# The View, the Scene, and the Camera

- The Scene contains the rendered 3D elements.
- It can be thought of as the Stage in Flash.
- Anything rendered on the Scene can be displayed to the user and manipulated.



# The View, the Scene, and the Camera

- The Camera enables the application user to observe the 3D elements from specified points of view.
- How the 3D elements are rendered on the Scene depend on specific properties of the Camera.





# PRIMITIVES ON PARADE



# Primitives on Parade

- Primitives are the basic building blocks of 3D software.
- Away3D supports 17 primitives
- We will focus on the following three
  - Triangle
  - Cube
  - Sphere



# Primitives on Parade

- Triangle:
  - This is the smallest and most basic of all the Primitives.
  - By combining multiple (a great many) triangles, you can create any 3D model.
  - By default, a Triangle contains only one (1) face – that is, only one side of the Triangle can be seen.



# Primitives on Parade

- **Cube:**
  - A Cube is an example of one of the many Primitives that are comprised of many triangles – a minimum of 12 triangles.
  - A Cube has width, height, and depth.
  - Each side of the Cube can be assigned its own color, image, texture, or materials.



# Primitives on Parade

- Sphere:
  - A Sphere is a more complex Primitive requiring more triangles
  - A Sphere is defined by its radius and the number of triangle segments.
  - The Sphere can be assigned its own color, image, texture, or materials.





FROM 0 TO 3D IN 10



# From 0 to 3D in 10

Let's take a look at our first Flash app  
using Away3D ...

... in 10 lines of code  
[mdcfug\_example\_01]





# MOVEMENT AND INTERACTIVITY



# Movement and Interactivity

- Any 3D element in the Scene can be positioned, rotated, scaled, and manipulated.
- Away3D uses the Cartesian coordinate system
- x: negative = left, positive = right
- y: negative = below, positive = above



# Movement and Interactivity

- You can set the position of any 3D element to any positive or negative value
- The resulting position is based on the “World Center” and the View
- The “World Center” is usually located in the center of your View.



# Example Code Review

Let's take a look at several app examples based on the topics we have covered.



# Q & A

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Slides and all code examples will be posted on:  
<http://therush.wordpress.com/>