CGT 353: Principles of Interactive and Dynamic Media
Video Integration

Introduction:

- Previous versions of Flash didn't allow you to do much with video
- Could import the video frames and convert them to vector representations
- Video in Flash is now quite powerful and a major force on the Web.
- This will have practical applications with the Web site project.
- Once again, students are not expected to become video experts in this class, but since it is such a prominent tool it must be discussed.
- Remember the "garbage in, garbage out" theory - if the ingredients are bad, the soup will be bad

Codecs:

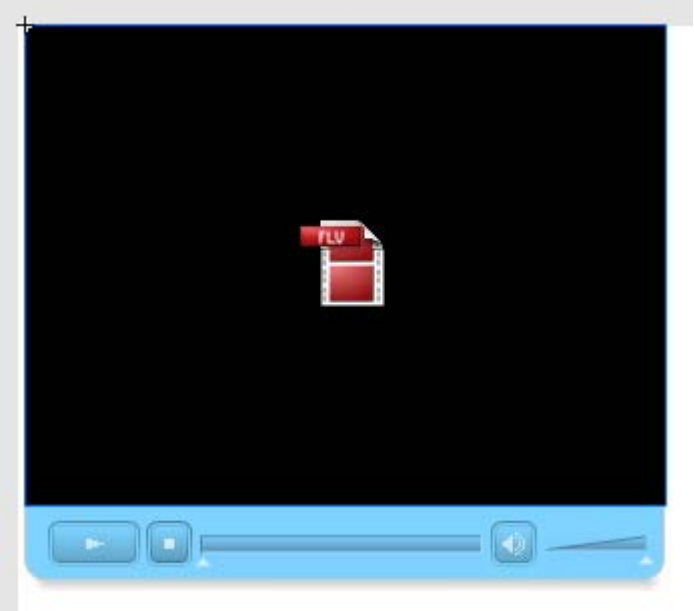
- **Sorenson Spark**, is used with FP6-7
- **On2 VP6**, is used with FP8 and FP9
- New codec **H.264** – built into Flash Player v9.0.r115
- H.264 works best with **F4V** video format which uses it provides a significantly better quality-to-bitrate ratio than previous codecs,
- **H.264** is more computationally demanding than the Sorenson Spark and On2 VP6 video codecs released with Flash Player 7 and 8.

Import Formats:

- As long as you have Quicktime or DirectX installed on your computer you can import:
    - .avi
    - .dv
    - .mov
    - .mpg
    - .mpeg
    - .asf

New Features:

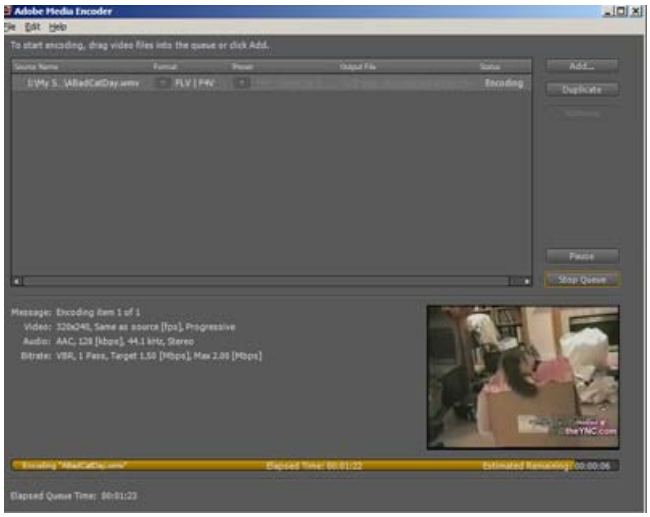
- **Adobe Media Encoder** – can now deinterlace video during encoding, which reduces artifacts
- **Flash 9 skins**
- **Cue points** – can embed directly into FLV file and trigger events during playback.
- **Better Quicktime exports –** can export AS-generated animations to .mov. Can also export content with nested movie clips and effects



Native Video Formats:

- The **FLV** format lets you import or export a static video stream with encoded audio.
- Intended for use with communications applications using files that share encoded data from the Flash Communication server.
- FLV Audio is compressed using **Audio Stream** settings in publish settings
- **F4V** is the newest and uses the **H.264**

Adobe Media Encoder:



- Based off the original **Flash Video Encoder** introduced in CS3
- Relatively new feature that allows you to batch encode videos

Cue Points:

- Cue points cause the video playback to trigger other actions within the presentation.
- Learn how to incorporate this in your videos and text.
- If you need to use either video with alpha channel support for compositing, or cue points to trigger synchronized events with video playback, you must use the On2 VP6 video codec.
- **F4V does not support alpha video channels.** Cue points can be embedded in the XMP metadata of an F4V file, but parsing that data requires custom ActionScript code.

Attributes of Digital Video:

Easier to add video for the Web today because:

- people have faster connections
- compression technologies are getting better

*** Like audio, prepping digital video is what takes the most work…

Image Attributes - File Formats and Compression:

- Should use uncompressed or lossless video in Flash
- Do this to avoid the "double whammy" compression as with JPEGS
- Strive to use digitally recorded footage

Frame Dimensions:

- For modem connections, should never exceed 160 pixels by 140 pixels
- Faster connections such as T1 and modems can utilize 320 x 240
- **Dial-up Modem NTSC 4 x 3 -**162 x 120
- **Dial-up Modem PAL 4 x 3 -** 160 x 120
- **T1/DSL/cable NTSC 4 x 3 -** 648 x 480
- **T1/DSL/cable PAL 4 x 3 -** 768 x 576

Audio Attributes:

- Use 22 kHz, 16-bit mono for the Web
- Anything more is usually just wasted

Video Components to Consider:

- **Length**
- **Frame Dimensions**
- **Frame Rate**: higher frame rate, more frames, bigger file size
- **High Movement:** Web video can be bumped down to 12-15 fps
- Talking head type of movies - 10 fps or less

Compression:

Two types of basic compression besides lossy and lossless:

Spatial (intraframe)

- Occurs within an individual frame of a clip
- Looks for redundant pixel colors within the frame
- Best for video with a lot of movement with significant changes across multiple frames

Temporal (interframe)

- Based on unchanging data that occurs between frames
- Areas between the frames that do no change are omitted
- Uses keyframes to serve as the basis for frame comparison
- **Delta frames** are the frames in between that are compressed
- More keyframes utilized, the better the accuracy but lower image quality
- Best for video without a lot of movement

Prepping Video for Use:

- Two basic methods:
  - Video capture
  - Direct download - using a digital camera with a USB or FireWire connection

Importing the Video – Step 1 – Select Video:

1. On your computer
2. On a server, streaming service, or Flash Media Server

Importing the Video – Step 2 Deployment:

1. Progressive download from server
2. Stream from Flash video service
3. From Flash Media server
4. As mobile device bundled into swf
5. Embed video in swf
6. Link Quicktime video

- **Note:** Make sure you are familiar with the specific nature of these options for your examinations

Embedding vs Streaming vs Linking:

- **Embedding** integrates the movie into your swf

- **Streaming** requires Flash Media Server or a service running it

  i. Here, each user opens a unique connection with a unique speed (requires much less bandwidth when people have slower connections)

- When **Linking** you have to export the movie as a Quicktime file (.mov)

Linking Video:

- Have to publish the Flash file as a QuickTime version of the file

Problems arise with linking because:

1. Some Actionscripting and other Flash objects will not work
2. End user now requires the QuickTime player

Video Settings:

- **Video Codec:** Sets either compression using either H.264**,** ON2 Vp6, or Sorenson Spark
- **Frame rate:** # frames that display for every second of playback
- **Key frame placement** – sets either custom or automatically placed intervals
- **Key frame interval** – Specifies the number of keyframes per frame of actual movie

Keyframes:

- Determines how often a full, high quality frame will be captured and stored in the final file
- **Higher the value in the keyframe interval field, the fewer the keyframes you will have in the compressed video**
- Ex. At 24, Flash will import a full frame every 24th frame.
- If computers processor is too slow to play all the frames in the movie, the playback will skips frames until it hits a keyframe
- The lower the keyframe value, the more keyframes are imported
- More keyframes allow users to fast forward or

rewind more quickly

- Increasing keyframes also increases image quality through interframe compression
- Careful: More you have the larger the movie will become

So in summary….

- Greater the keyframe value:
    - fewer the keyframes
    - smaller the filesize
    - poorer the image quality
- Lower the keyframe value:
    - More keyframes
    - Increased filesize
    - Higher image quality
- **Note:**
    - Video on the Timeline can be removed as frames when embedded
    - Can also add frame labels if you wish

Video Clip Properties:

- Do not resize the video inside Flash as it will not affect file size but can affect quality
- Swapping video clips allows you to create template files them swap them out with other video
- Be careful because swapping will not change the length of the timeline
- Can also update, import, and export clips in the library

Using the Adobe Media Encoder:

- Problem with the video wizard is it can take a long time if you have a lot of clips to encode
- Use the **Adobe Media Encoder** to batch process your clips and add cue points

Revisiting Cue Points:

- Again, established markers in the video that you can use to trigger other actions
- **Navigation cue points** insert a keyframe at that point in the video clip – used for navigating or locating the specified point in the clip
- **Event cue points** are used to trigger AS methods
- **Parameters** are sets of key/value pairs that get sent to the ActionScript methods triggered by the cue point
- We will discuss video more when we get into ActionScript more.

Tips from Adobe: http://help.adobe.com/en_US/Flash/10.0_UsingFlash/WS9222D73A-676D-41cd-9222-A4884858BBA3.html

1. **Work with video in the native format of your project until your final output**
2. **Strive for simplicity -** Avoid elaborate transitions—they don't compress well and can make your final compressed video look "chunky"
3. **Know your audience data rate**
4. **Select the proper frame rate**
5. **Select a frame size that fits your data rate and frame aspect ratio**
6. **Stream for best performance**
7. **Know progressive download times**
8. **Remove noise and interlacing**
9. **Follow the same guidelines for audio**

For video tutorials about working with video in Flash, see the following:

- Using video in Flash: www.adobe.com/go/vid0136
- Creating FLV and F4V files: www.adobe.com/go/lrvid4097_xp
- Using Adobe Media Encoder: www.adobe.com/go/vid0138
- Creating content for Adobe After Effects: www.adobe.com/go/vid0139
- Working with Flash and After Effects: www.adobe.com/go/lrvid4098_xp