

CGT 141/CPT 141 Lecture 14 Wk 8

Media Preparation Issues

Dealing with Audio

- Two fundamental types:
 - o Digital audio (sampled/recorded)
 - o Synthesized audio
 - MIDI files (.mid)
 - .mod files
- Attributes:
 - o Resolution/Sampling Rate – frequentness of samples over time
 - Controls clarity of clip
 - o Bit depth – number of bits available to describe amplitude at any instance in time
 - Controls fidelity of clip
 - o Channels – number of independent speaker channels
- Other issues:
 - o Bit rate – speed of connection required for streaming to exceed download
 - $\text{Bit rate} = \text{file size} / \text{length of clip}$
 - o Compression: ADPCM, MP3, others
- Formats:
 - o Windows Waveform (.wav) or Audio Interchange File Format (.aif)
 - o Motion Picture Experts Group (MPEG) version 3 (.mp3)
 - o Apple QuickTime (audio-only) Movies (.mov)
 - o RealMedia/RealAudio (.rm, .ra)
 - o Windows Media (.wma, .asf)

Using Audio

- Audience Considerations
 - o Bandwidth
 - o Playback – QuickTime Player or Windows Media Player
- Optimization
 - o Length of clip
 - o Channels: use only 1
 - o Bit depth: 8-bit versus 16-bit
 - o Sampling Rate: 44 kHz, 22 kHz, 11 kHz, other...
- Applications

Dealing with Video

- Attributes: based on attributes of audio and raster graphics, as it is both in one file.
- Issues:
 - o Compression
 - Lossy versus lossless
 - Spatial versus temporal

- Spatial (intraframe) – predominantly still images; compressibility of individual frames
 - Temporal (interframe) – for excessive movements; compressibility of changes over time
- Various compressors available for various file formats; format often does not mean a specific compressor.
- o Data rate/bit rate
 - $\text{Data rate or bit rate} = \text{File size} / \text{length}$
- Formats:
 - o Apple QuickTime (.mov)
 - o RealMedia (.rm)
 - o Windows Media (.wmv, .asf)
 - o Audio Video Interleaved (.avi)
 - o Motion Picture Experts Group (.mpg)
- Applications

Other Forms of Media

- 3D Media/VR
 - o 3D still rather limited on the web
 - o Types:
 - o Advantages/Disadvantages
- Other Multimedia
 - o Macromedia Technologies
 - Flash
 - Huge penetration in web development community
 - Application, multimedia authoring environment
 - Advantages
 - o small file sizes
 - o Automatic antialiasing
 - o Scaleable, resolution independent
 - o Animation (frame-by-frame & keyframe)
 - o Sound (ADPCM & MP3)
 - o Interactivity
 - o Scripting – ActionScript, modeled after JavaScript
 - “Shockwave”
 - Generic name for Macromedia-based web-ready files
 - Can be used to publish Macromedia Director (CD/DVD authoring engine) files to the web
 - o Adobe
 - LiveMotion
 - Flash competitor

Applets, Embeds and Objects

Java Applets

- Object-oriented programming language developed by Sun Microsystems derived from C++ (more security and easier to use)
- Although some aspects are similar to JavaScript, Java is unrelated.
- Full-fledged programming language (applets are but one form of output in Java)
- “Small, simple and portable” executable programs
- Platform Independence
- Bytecode – machine code – independent
 - Most programming languages compile platform-specific binary files that run only on the platform for which it was compiled
 - Java is intended to be “written-once, run-anywhere” because it is compiled to bytecode, which is then interpreted by platform specific interpreters
- Historically, applets are embedded using <applet> tag (now deprecated)
 - Replacement tag: <object> tag
 - However, some applets require the use of the <applet> tag and its associated <param> tag.

Why <embed> and <object>?

- Because there are two ways to add “extensions” to the browser, two tags exist also.
- Ways to extend the browser:
 - Plugins – additional code components added to the browser to support extraneous media elements or functionality; developed as original method for extensibility
- Supports extensibility in the browser only.
 - ActiveX components/controls – Microsoft developed “system” level “plugins” (called ActiveX components) that can function for the browser, as well as every application on the system (at least theoretically anyway).
- Extends to every application on the system.
- When the browser encounters the <embed> or <object> tags it:
 1. Tries to find a plugin to support the element (using MIME).
 2. Then tries to find a helper application to support the element (using MIME).
 3. Prompts the user: what to do with the file?

<object>

- Began as an IE-specific tag (still not supported in Netscape 4.73 or lower).
 - This means, because Netscape 6 problematic, most users are still on version 4.73, which knows nothing of the <object> tag.
 - Thus, many times <object> and <embed> are used simultaneously for proper rendering.
- Is the official all-purpose object container and can be used on a variety of media elements, from images to Flash to Java.
- Attributes:

- classid – in most cases points to the ActiveX component that should be used
- codebase – points to the URL where component can be downloaded, if not on the user's machine
- id – text name of the element (for reference purposes)
- width and height – not always required, but...
- <param>
 - Is used in conjunction with the <object> tag to specify “object-specific” characteristics or properties.
 - Available properties depend on the ActiveX component and media element
 - Is used inside the <object>...</object> container
- Example (Flash Movie):

```
<object id="openpage" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000"
codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=4,0,0,0" width="100%" height="100%">
<param name="Movie" value="openpage.swf">
< param name ="Play" value="true">
< param name ="Quality" value="best">
< param name ="loop" value="false">
< param name ="menu" value="false">

<embed name="openpage" mayscript="mayscript" src="openpage.swf"
menu="false"
swLiveConnect="true" width="100%" height="100%" quality="best" play="true"
type="application/x-shockwave-flash"
pluginspage="http://www.macromedia.com/shockwave/download/index.cgi?P1_Prod_Version=ShockwaveFlash">
</embed>

</object>
```

Note the use of the <embed> inside the <object>:

- If read by IE 2 or higher or Netscape 6 or higher, the <embed> is ignored.
- If read by Netscape 4.73 or lower, the <object> and <param> tags are ignored.

<embed>

- Not as extensible as <object>
- Predominantly used for video clips, Flash, Shockwave and RealMedia elements
- Attributes:
 - src – the source media file
 - height and width

- o align – as it relates to surrounding elements
- o hspace and vspace – similar to
- o Other element specific attributes (see documentation about media element for specific attributes supported).