Multimedia Authoring: Systems and Applications

What is an Authoring System?

An Authoring System is a program which has pre-programmed elements for the development of interactive multimedia software titles.

Authoring systems vary widely

- orientation,
- capabilities, and
- learning curve.
Why should you use an authoring system?

- can speed up programming possibly content development and delivery
- about 1/8th
- However, the content creation (graphics, text, video, audio, animation, etc.) not affected by choice of authoring system;
- time gains – accelerated prototyping
Authoring Vs Programming

• **Big** distinction between Programming and Authoring.

• **Authoring** —
  – assembly of Multimedia
  – possibly high level graphical interface design
  – some high level scripting.

• **Programming** —
  – involves low level assembly of Multimedia
  – construction and control of Multimedia
  – involves real languages like C and Java.
Multimedia Authoring Paradigms

The *authoring paradigm*, or *authoring metaphor*, is the methodology by which the authoring system accomplishes its task.

There are various paradigms

**Scripting Language**

**Iconic/Flow Control**

**Frame**

**Card/Scripting**

**Cast/Score/Scripting** — Macromedia Director

**Hypermedia Linkage**

**Tagging** — SMIL
Scripting Language

- closest in form to traditional programming. The paradigm is that of a programming language, which specifies (by filename)
  - multimedia elements,
  - sequencing,
  - hotspots,
  - synchronization, etc.
- Usually a powerful, object-oriented scripting language
- in-program editing of elements (still graphics, video, audio, etc.) tends to be minimal or non-existent.
- media handling can vary widely
Examples

- The Apple’s HyperTalk for HyperCard,
- Assymetrix’s OpenScript for ToolBook and
- Lingo scripting language of Macromedia Director

Here is an example lingo script to jump to a frame

global gNavSprite

on exitFrame
    go the frame
    play sprite gNavSprite
end
Iconic/Flow Control

• tends to be the speediest in development time
• best suited for rapid prototyping and short-development time projects.
• The core of the paradigm is the Icon Palette, contains:
  – possible functions/interactions of a program, and
  – the Flow Line — shows the actual links between the icons.
• slowest runtimes programs , high interaction overheads

Examples:
• Authorware
• IconAuthor
Frame

- similar to the Iconic/Flow Control paradigm
- usually incorporates an icon palette
- the links drawn between icons are conceptual
- do not always represent the actual flow of the program.

Examples

- Quest (whose scripting language is C)
- Apple Media Kit.
Figure 4: Macromedia Authorware Iconic/Flow Control Examples
Card/Scripting

- paradigm provides a great deal of power (via the incorporated scripting language)
- suffers from the index-card structure.
- Well suited for Hypertext applications, and especially suited for navigation intensive (e.g. Cyan’s "MYST" game) applications.
- extensible via XCMDs and DLLs;
- all objects (including individual graphic elements) to be scripted;
- many entertainment applications are prototyped in a card/scripting system prior to compiled-language coding.
Cast/Score/Scripting

- uses a music score as its primary authoring metaphor
- synchronous elements are shown in various horizontal *tracks*
- simultaneity shown via the vertical columns.
- power of this metaphor lies in the ability to script the behavior of each of the cast members.
- easily extensible to handle other functions (such as hypertext) via XOBJs, XCMDs, and DLLs.
- best suited for animation-intensive or synchronized media applications;

*Examples*

- Macromedia Director
- Macromedia Flash — cut Down director Interface
Hierarchical Object

- paradigm uses a object metaphor (like OOP)
- visually represented by embedded objects and iconic properties.
- learning curve is non-trivial,
- visual representation of objects can make very complicated constructions possible.
Figure 5: Macromedia Director Score Window
Figure 6: Macromedia Director Cast Window
Figure 7: Macromedia Director Script Window
Hypermedia Linkage

- similar to the Frame paradigm
- shows conceptual links between elements
- lacks the Frame paradigm’s visual linkage metaphor.
Tagging

tags in text files to

• link pages,
• provide interactivity and
• integrate multimedia elements.

Examples:

• SGML/HTML,
• SMIL (Synchronised Media Integration Language),
• VRML,
• 3DML and
• WinHelp
Issues in Multimedia Applications Design

There are various issues in Multimedia authoring.

**Issues involved:**

- Content Design
- Technical Design
Content Design

Content design deals with:

- What to say, what vehicle to use.

“In multimedia, there are five ways to format and deliver your message.

You can

- *write* it,
- *illustrate* it,
- *wiggle* it,
- *hear* it, and
- *interact* with it.”
Scripting (writing)

Rules for good writing:

1. Understand your audience and correctly address them.

2. Keep your writing as simple as possible. (e.g., write out the full message(s) first, then shorten it.)

3. Make sure technologies used complement each other.
Graphics (*illustrating*)

- Make use of pictures to effectively deliver your messages.
- Create your own (draw, (color) scanner, PhotoCD, ...), or keep "copy files" of art works. – "Cavemen did it first."

Graphics Styles

- fonts

- colors
  - pastels
  - earth-colors
  - metallic
  - primary color
  - neon color
Animation (wiggling)  Types of Animation

- Character Animation – humanise an object
- Highlights and Sparkles
- Moving Text
- Video – live video or digitized video
2. When to Animate

- Enhance emotional impact
- Make a point (instructional)
- Improve information delivery
- Indicate passage of time
- Provide a transition to next subsection
Audio (*hearing*)

Types of Audio in Multimedia Applications:

1. Music – set the mood of the presentation, enhance the emotion, illustrate points

2. Sound effects – to make specific points, e.g., squeaky doors, explosions, wind, ...

3. Narration – most direct message, often effective
Interactivity (*interacting*)

- interactive multimedia systems!
- people remember 70% of what they interact with (according to late 1980s study)
Types of Interactive Multimedia Applications:

1. Menu driven programs/presentations
   – often a hierarchical structure (main menu, sub-menus, ...)

2. Hypermedia
   +: less structured, cross-links between subsections of the same subject → non-linear, quick access to information
   +: easier for introducing more multimedia features, e.g., more interesting ”buttons”
   -: could sometimes get lost in navigating the hypermedia

3. Simulations / Performance-dependent Simulations
   – e.g., Games – SimCity, Flight Simulators
Technical Design

Technological factors may limit the ambition of your multimedia presentation.

Studied Later in detail.
Storyboarding

The concept of storyboarding has been by animators and their like for many years.
Storyboarding

- used to help plan the general organisation
- used to help plan the content of a presentation by recording
- organizing ideas on index cards,
- placed on board/wall.
- Storyboard evolves as the media are collected and organised:
  - new ideas and refinements to the presentation are made.
Storyboard Examples

- DVD Example
- Storyboarding Explained
- Acting With a Pencil
- The Storyboard Artist
- Star Wars Quicktime Storyboard
Overview of Multimedia Software Tools

Digital Audio

Macromedia Soundedit — Edits a variety of different format audio files, apply a variety of effects (Fig 8)

Figure 8: Macromedia Soundedit Main and Control Windows and Effects Menu
CoolEdit/Adobe Audtion — Edits a variety of different format audio files

Many Public domain audio editing tools also exist.
Music Sequencing and Notation

Cakewalk

• Supports General MIDI
• Provides several editing views (staff, piano roll, event list) and Virtual Piano
• Can insert WAV files and Windows MCI commands (animation and video) into tracks
Cubase

- A better software than Cakewalk Express
- Intuitive Interface to arrange and play Music (Figs 9 and 10)
- Wide Variety of editing tools including Audio (Figs 11 and 12)
- Score Editing
Figure 9: Cubase Arrange Window (Main)
Figure 10: Cubase Transport Bar Window — Emulates a Tape Recorder Interface
Figure 11: Cubase Audio Window
Figure 12: Cubase Audio Editing Window with Editing Functions
Logic Audio

• Cubase Competitor, similar functionality

Marc of the Unicorn Performer

• Cubase/Logic Audio Competitor, similar functionality
Figure 13: Cubase Score Editing Window
Image/Graphics Editing

Adobe Photoshop

- Allows layers of images, graphics and text
- Includes many graphics drawing and painting tools
- Sophisticate lighting effects filter
- A good graphics, image processing and manipulation tool

Adobe Premiere

- Provides large number (up to 99) of video and audio tracks, superimpositions and virtual clips
- Supports various transitions, filters and motions for clips
- A reasonable desktop video editing tool

Macromedia Freehand

- Graphics drawing editing package

Many other editors in public domain and commercially
Image/Video Editing

Many commercial packages available

- Adobe Premier
- Videoshop
- Avid Cinema
- SGI MovieMaker
Animation

Many packages available including:

- Avid SoftImage
- Animated Gif building packages e.g. GifBuilder
Multimedia Authoring

– Tools for making a complete multimedia presentation where users usually have a lot of interactive controls.

Macromedia Director

• Movie metaphor (the cast includes bitmapped sprites, scripts, music, sounds, and palettes, etc.)
• Can accept almost any bitmapped file formats
• Lingo script language with own debugger allows more control including external devices, e.g., VCRs and video disk players
• Ready for building more interactivities (buttons, etc.)
• follows the cast/score/scripting paradigm,
• tool of choice for animation content (Well FLASH for Web).
Authorware

- Professional multimedia authoring tool
- Supports interactive applications with hyperlinks, drag-and-drop controls, and integrated animation
- Compatibility between files produced from PC version and MAC version

*Other Authoring Tools mentioned in notes later*