2. Issues in Multimedia Authoring

Reference: Chapters 5-8 in D.E. Wolfgram, "Creating Multimedia Presentations", *QUE*, 1994.

2.1. Multimedia Authoring Metaphors

- *Authoring* -- the process of creating multimedia applications
- *Authoring metaphor*, also known as *authoring paradigm*, is the methodology for authoring multimedia applications.

  The following are some of the common ones:

1. **Scripting Language Metaphor**
   - use a special language to enable interactivities (button, mouse, etc), and to allow conditionals, jumps, loops, functions/macros
   - e.g., OpenScript in Toolbook by Asymetrix, or JavaScript, VBScript, or sometimes the widely used programming language C.
   - Some examples from the textbook
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   -
   - `// load an MPEG file`
   - `extFileName of MediaPlayer "theMpegPath" = "c:\windows\media\home33.mpeg";`
   -
   - `// start playback`
   - `get extPlay() of MediaPlayer "theMpegPath";`
   -
2. **Slide Show Metaphor**
   - by default a linear presentation
   - e.g., PowerPoint, ImageQ
3. **Hierarchical Metaphor**
   - organized into a tree structure
   - seen often in menu-driven applications
4. **Iconic/Flow-control Metaphor**
   - graphical icons and flow chart to help authoring
   - e.g., Authorware by Macromedia

5. **Card/Scripting Metaphor**
    - index-card structure, good for hypertext/hypermedia
    - e.g., HyperCard by Apple, HyperStudio by Knowledge Adventure
      Cards in HuperStudio
6. **Cast/Score/Scripting Metaphor**
    - with cast members, music scores, and scripting language; many synchronous horizontal "tracks" simultaneously shown in vertical columns;
    - e.g., Director by Macromedia (it uses Lingo as its scripting language)

2.2. Content Design

- What to say, what vehicle to use.

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"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."                  -- D.E. Wolfgram
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2.2.1 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.

2.2.2 Graphics (*illustrating*)

- Make use of pictures to effectively deliver your messages.
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- `-- "A picture is worth ten-thousand words."`
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- Create your own (draw, (color) scanner, PhotoCD, ...), or keep "copy files" of art works.
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- `-- "Cavemen did it first."`
- Color Themes -- be consistent with the contents
    - pastels
    - earthtones
    - metallic colors
    - primary colors

- neon colors

2.2.3 Animation (*wiggling*)

Types of Animation

- Character Animation -- humanize an object

  e.g., a toothbrush, a car, a coke bottle, etc.

  Factors in choosing a character

  - Emotion -- Is it happy, sad, funny, sloppy, ...?
  - Movement -- Is it fast, slow, bumpy, ...?
  - Visual style -- Is its color/texture consistent with the rest?
  - Copyright -- "Don't use Mickey before checking with Walt."
  - Adequacy -- e.g., Does it provide various poses (can't make a broomstick sit!)
- Highlights and Sparkles

  e.g., to pop a word in/out of the screen, to sparkle a logo

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  --> to draw attention
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- Moving Text

  e.g., put up one character at a time like a typewriter
  e.g., "pulsing" -- the word grows/shrinks (or changes color) a few times

  Note: Do not slowly move entire line of text, they are not readable. Instead, for example, slide the bullets in and out.

- Video -- live video or digitized video

  +: more powerful than still images
  +: often easier to obtain than graphics animation
  -: takes a lot of disk space
  -: sometimes needs special hardware

2.2.4 Audio (*hearing*)

Types of Audio in Multimedia Applications:

- Music -- set the mood of the presentation, enhance the emotion, illustrate points
- Sound effects -- to make specific points, e.g., squeaky doors, explosions, wind, ...
- Narration -- most direct message, often effective

2.2.5 Interactivity (*interacting*)

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

Some Common Types of Interactive Multimedia Applications:

- Menu-driven programs and presentations
- Hypermedia
- Simulations / Performance-dependent Simulations
  e.g., Games -- SimCity, Flight Simulators
- Video-conferencing (NetMeeting, etc.)

2.3. Visual Design

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1. **Themes and Styles**

   -- A multimedia presentation should have a consistent theme/style, it should not be disjointed and cluttered with multiple themes.

   -- The choice of theme/style depends on the content and the styles/emotions of your audience.

   Some Possible Themes:

   - Cartoon theme

     +: interesting / entertaining
     -: must be consistent with the character's personality

   - Traditional theme -- straightforward marketing pieces

     +: simple, often informative
     -: not as interesting

   - High tech theme -- contemporary computer art work (morphing, texture mapping, metal texture, explosions, ...)

     +: attractive, easy to animate

- Technical theme -- include blueprints, 3D models of the product, ... e.g., start with a drawing, then transformed into a rendered image.

  +: shows adequate technical information
  +: gives impression of solid design and construction

2. **Graphics Styles**

   Reference: R. Vetter, C. Ward and S. Shapiro, "Using color and text in multimedia projections", *IEEE Multimedia*, Vol. 2, No. 4, pp. 46-54, 1995.

   - Some *color schemes* (e.g., natural and floral for outdoor scenes) and *art styles* (e.g., oil paints, watercolors, colored pencils, pastels) are best combined with a certain theme/style.

   Color Principles and Guidelines

   - Do not use too many colors !
   - Be consistent with the use of color
   - Use colors to separate ideas and signal changes

   Fonts

   - Size: -- e.g., Use large fonts (e.g., 18 to 36 points), no more than 6-8 lines per screen.
   - Style: -- e.g., serif vs. sans serif

3. **When to Animate**

   "A leaf doesn't flutter if the wind doesn't blow."

   Only animate when it has a specific purpose

   - Enhance emotional impact

     e.g., dove softly flapping its wings --> peace
     e.g., air bag explosion + dummy movements --> car crash.

   - Make a point

     e.g., show insertion of a memory chip onto the motherboard (much better than a diagram)
     e.g., Microsoft Golf (instructional)

   - Improve information delivery

     e.g., "pulsing" words (in and out of screen) adds emphasis

- Indicate passage of time

  e.g., clock/hourglass --> program still running
  e.g., animated text --> to prompt for interaction/response

- Provide a transition to next section
  - Wipes -- e.g., L-to-R, T-D, B-U, diagonal, iris round, center to edge, etc. Often used to indicate location or time changes, i.e., lead the viewer from one segment of the story to the next.
  - Dissolve -- the current image distorts into an unrecognizable form before the next clear image appears, e.g., boxy dissolve, cross dissolve, etc.
  - Fade -- a metaphor for a complete change of scene
  - Cut -- immediate change to next shot
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- **"Don't use anything except a cut unless the effect contributes to the**
- **clarification and intensification of the visual sequence and is appropriate**
- **to the content, look, and pace of the program material" [Zettl, 1990]**
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4. **Pace and Running length**

   A few guidelines:

   - Allow a block of text to be slowly read twice.
   - Transition time should be an indication of real-time.
     - dissolve -- time delay, scene change
     - cut -- two views of same scene at same time, or abrupt scene change
   - Running length
     - self running presentation: 2-3 minutes
     - limited interaction: 5-6 minutes
     - complete analytical, hands-on demo: < 15 minutes
     - with questions, discussions: > 30 minutes

   ** build in breaks for long presentations

5. **Basic Layout**

   (a) Title
   (b) Action area
   (c) Narration
   (d) Dialog
   (e) Interactive controls

   - make sure that the information delivery path in the layout is smooth, not irregular/jumpy

- use headlines/subtitles, additional shapes, buttons, fonts, backgrounds and textures to enhance the visual appearance.

Notes on Video Transitions

1. Cross Dissolve

$$D = (1 - \alpha(t)) \cdot A + \alpha(t) \cdot B$$

e.g. $\alpha(t) = k \cdot t$, $t_{max} = t_{10}$

$\alpha(t_0) = 0$, $\alpha(t_1) = 0.1$, $\alpha(t_2) = 0.2$, $\cdots$, $\alpha(t_{10}) = 1$

- Special cases:

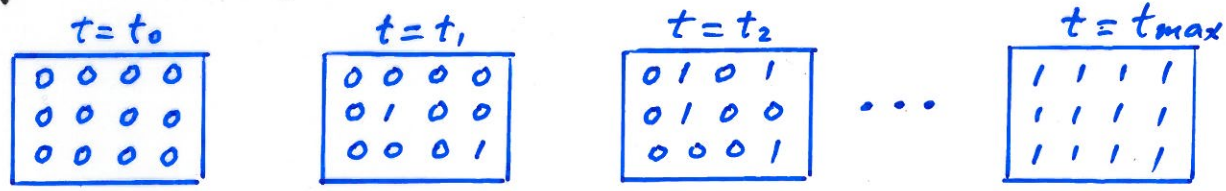
  Fade-in : A is entirely black (or white)
  Fade-out : B " " "

2. Dither Dissolve

$$D = (1 - \alpha(t,x,y)) \cdot A(x,y) + \alpha(t,x,y) \cdot B(x,y)$$

- $\alpha(t)$ takes only 0 or 1 value, changes abruptly

e.g. $\alpha(t,x,y)$:



- Special case:

e.g. Horizontal wipe

$\alpha(t,x,y)$: