Multimedia Building Blocks

Slides courtesy of Tay Vaughan - “Making Multimedia Work”
Because multimedia applications are designed as multi-sensory experiences, they are predominantly graphic.

The content specialist is responsible for providing the production team with:
- graphics
- photos
- logos
- colors
Bitmapped and Vector Graphics

• Bitmaps: The computer stores information about the screen location and color value of each dot.
  – The refresh rate for bitmap is usually faster than for vector images
  – Used for Photo realistic images

• Vector images: are composed of a large number of lines and circles, each reflecting a mathematical relationship.
  – Therefore, when refreshing a screen with a vector image, the computer must calculate all vectors again.
  – However, vector images are more precise and require less memory.
  – Vector’s are scalable without losing resolution or quality
More on Bitmap and Vector images

• A vector is a line that is described by the location of its two end points
  • Rect 0,0,400,400 (Cartesian coordinate system)
  • This image starts in upper-left corner and move 200 pixels horizontally to the right, and 400 pixels vertically downward

• Vector software is used by CAD programs, 3-D graphics programs, and graphic artists programs as well.

• The images can be converted either way
Creating 2-D Images

Learn How to Use the Help tool

- Selection
- Freehand
- Dropper tool

• PaintShop Pro Tool Bar
Other Images

- Photo CD’s
- Clip Art
  - Consists of collections of drawings, usually available as black and white or 4 bit (16 color) images.
  - The files are available in EPS, PIC, PICT, WMF and BMP formats
- Charts
- Maps
Image Acquisition: Scanning Basics

- Determine whether the image will be printed or displayed on a monitor or projector
- Select the Area to scan
- Decide the scanning resolution of the resulting digitized file
- Decide the amount of light and contrast desired for the resulting image
- Determine the color cast you want to eliminate during the scan
Scanning Resolution and Resizing

- Factors to consider:
  - Size in bytes
  - Use of image
  - How much manipulation or editing
Properties of Digitized images

• Bit resolution or color resolution
  – 1 bit (2 color)
  – 2 bit (4 colors)
  – 4 bit (16 colors)
  – 8 bit (256 colors)  Good
  – 16 bit (65,536 colors) Excellent
  – 24 bit (16.7 million) Photo-realistic

• Device resolution or output resolution (dpi)
  – Refers to dpi of output device, a typical monitor is 72 dpi

• Screen resolution (screen frequency)

• Image resolution
Two important Notes

• The higher the image resolution the greater the file size
• Do not lower the resolution and later increase the resolution
Image File Formats

- **GIF** – 8 bits of color depth or 256 colors
  - Gif compresses drawings and cartoons that only have a few colors much better than jpeg
- **JPEG** – 24 bits of color depth (millions of colors) is powerful but uses a lossy compression method.
  - JPEG introduces visible defects & sharp edges and lines that blur, especially with small-size text.
- **PNG** – Portable Network Graphics
- **Warning!** Do not edit and re-edit files in jpeg format. It recompresses it and the picture degenerates.
<table>
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<tr>
<th>Format Name</th>
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Digital Acquisition

- Digital Still Cameras
- Digital Still Video
- Scanning
Image Editing Basics:

- Cropping
- Output-Level Correction
  - During scanning process the images losses resolution, contrast, and details in the shadows.
  - The levels dialog box enables you to correct the output levels of RGB
- Brightness and Contrast Adjustments
- Filters
3D Images

• Primitives
• Camera and Light Objects
• Rotation tools
• Resizing Tools
• Surfaces
• Extruding
• Lathing
• Rendering – Toy Story was rendered with on a “farm” of 87 dual-processor and 30 quad processor 100MHz SPARCstation 20s. Took 46 days.
• Panoramas
Color

• **Light** comes from an atom when an electron passes from a higher to a lower energy level
• Each **atom** produces uniquely specific **colors**
• Known as **quantum theory** developed by physicist Max Planck in the late 19th century.
• Niels Bohr, another physicist, later showed that an excited atom that has absorbed energy and whose electrons have moved into higher orbits with throw energy in the form of quanta, or **photons**, when it reverts to a stable state.
• That is where light comes from
Color con’t

• Color is the **frequency of a light** wave within the narrow band of the electromagnetic spectrum to which the human eye responds.

• The **rainbow** is an ascending frequency of the **visible light spectrum**: red, orange, yellow, green, blue, indigo, and violet.

• Light that is **infrared**, or below the frequency of red light, **not perceivable** by the human **eye**, can be created and viewed by electronic diodes and sensors.

• Used for remote controls, wireless communications, etc. (Vaughan, 2001, p. 265)

• [www.diacenter.org/km/index.html](http://www.diacenter.org/km/index.html) favorite color in the world is blue
Color

- Hues – human can differentiate among millions of colors, or hues, consisting of combinations of RGB
- Brightness or lightness is the percentage of black or white mixed in a color
- Saturation is the intensity of the color where 100% is pure and 0 is white, black, or gray.
- Dithering
- Opacity
References
