CS 107 Fall 2006

Lecture 8: Digital Media

Overview.

- Digital music: sampling, wave forms.
- Digital photography and video: simple and complex editing.
- Digital graphics: Illustrator, Graffle, and CAD systems.
- Virtual reality.

1   Digital Music

- Wave forms: frequency (pitch), amplitude (volume), digitization (sampling)
- Discussion: Identifying and removing "clicks" from a recording.
- Demo: Interpreting the pitch and amplitude with screen graphics.
- Common Formats: WAV, MP3

Current applications.

- Voice recognition: security, forensics, door locks.
- Speech recognition: free hands for medical personnel, allow severly handicapped people to operate robots.
- Problem: the need to train the software to recognize specific words or a specific person.
- Problem: what if a person is sick and his voice does not have the right frequency profile?
- Problem: can't be used for situations in which a power failure would cause failure, and failure would cause big trouble.

2   Digital Photography

Bit-mapped images (scanners, photographs, PDF)

- Pixels.
- Intensity: BW: 0–255 (black–white)
- Color: RGB 0–255 for three primary colors, Red, Green, Blue
- Demo: Use of color in a HTML page.
- Resolution vs. physical size.
- Demo: including a photo in a HTML page. Making it fuzzy by scaling it much larger than its natural size (resolution).
- Common bit-mapped formats: .bmp, .jpg, .gif

3   Digital Graphics

Vector images (Postscript, graffle, CAD)

- An image is represented as a series of vectors (lines).
- Sets of lines are grouped to represent objects.
- Objects can be connected, moved, rearranged.
- Demo: a diagram with two squares, a circle, and a line. Layers. Moving the parts.
- To use, convert to PDF.