Introduction to Web Design & Computer Principles
CSCI-UA 4

Web Audio and Video
HTML5 Media Elements
Sound consists of pressure waves moving through air.

Without air, there is no sound.

Our ears are sensitive to pressure waves and transmit these signals to the brain.
Hand Clap
Periodic Wave
Sound Recording

Acoustic waves to electrical waves

A microphone consists of a small membrane that vibrates

Movements of the membrane are translated into electrical signals

Higher pressure typically corresponds to higher voltage
Digital Audio
Analog to digital

An audio signal is an analog (continuous) format

The electrical waves must be converted to digital information for computational processing

Digital recording is accomplished with an analog-to-digital converter (ADC)

The ADC captures a snapshot of the electric voltage on an audio line and represents it as a digital number

Capturing the voltage thousands of times per second creates a good approximation of the original audio
Digital/Analog Sound
Digital Audio Playback

Digital to analog

All computers must give us analog signals to be useful

The screen converts digital information to light

The digital-to-analog converter (DAC) takes the sample and sets a certain voltage on the analog outputs to recreate the signal

This voltage is conveyed to the speakers which create pressure waves in the air
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**Audacity**
Open-source sound editing software

- Free, open-source software that can be altered and redistributed
- Multilingual
- Easy to use
- Records live audio
- Cuts, copies, splices and mixes sounds together
- Exports to different formats (with appropriate plugin)
Flash
Multimedia environment for the production of interactive applications and animation

Animation, Video, Interactivity
Manipulates raster and vector graphics
Pioneered vector graphics on the Web
Supports streaming of audio and video
Scripting language called "ActionScript"
Commonly used for creating websites, animation, standalone applications, streaming media, and games
Adobe purchased Macromedia in 2005
Tried to kill it before it acquired it
Development continued at Macromedia, including scripting language, to become a full presentation development tool
Flash plugin becomes nearly ubiquitous in Web browsers
Filled in a gap for delivering video content over the Web
Requires Flash player plugin
Flash on the Wane

H.264 video codec and open-source video standards begin to dislodge video content

Apple releases iPhone in 2007 without support for Flash

Harder to support processor-intensive Flash player on mobile browsers

HTML 5 gaining traction

2011: Adobe announces discontinuation of support for mobile Flash development
HTML5 Audio and Video

HTML5 now supports audio and video natively in the web browser.

For years, it was necessary to rely on a third party to deliver this kind of content.

Now we can use the `<audio>` and `<video>` tags.