INTERACCION HUMANO-MAQUINA

ING. OTTO PARRA GONZALEZ

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INTERACCION HUMANO-MAQUINA

INTRODUCCION

INTERACCION HUMANO-MAQUINA

MULTIMEDIA: WHAT IT IS?

- **Multimedia** is any combination of text, art, sound, animation, and video delivered to you by computer or other electronic or digitally manipulated means.

- Multimedia is a woven combination of **digitally manipulated** text, photographs, graphic art, sound, animation, and video elements. When you allow an end user—also known as the viewer of a multimedia project—to control what and when the elements are delivered, it is called **interactive multimedia**. When you provide a structure of linked elements through which the user can navigate, interactive multimedia becomes **hypermedia.**

MULTIMEDIA PROJECT: WHAT IT IS?

- The software vehicle, the messages, and the content presented on a computer, television screen, PDA (personal digital assistant), or mobile phone together constitute a **multimedia project**.

- Producing a **multimedia project** or a **web site** requires more than creative skill and high technology. You need organizing and business talent as well.

Plan   Produce   Edit   Support   Resources

MULTIMEDIA PROJECT

- Determining how a user will interact with and navigate through the **content** of a project requires great attention to the message, the **scripting** or **storyboarding**, the artwork, and the programming. You can break an entire project with a badly designed interface. You can also lose the message in a project with inadequate or inaccurate content.

- A multimedia project can be **linear**, starting at the beginning and running through to the end. When users are given navigational control and can wander through the content at will, multimedia becomes **nonlinear** and user interactive, and is a powerful personal gateway to information.

Storyboard Template

Project Title: Pengenalan Kepada Multimedia abu

FileMenu Utama

Definasi Multimedia

A

Screen Layout Description

Video

Text
A – beberapa contoh definasi multimedia

Animation

Image

Color
Background - Imej
Foreground – Brown, Black

Sound
- Kitaro

Action
Klik tetikus pada File untuk keluar dari aplikasi
Klik tetikus pada Menu Utama:
- Klik pada Elemen pergi ke skrin 4
- Klik pada Aplikasi pergi ke skrin 5

MULTIMEDIA PROJECT

- Multimedia elements are typically sewn together into a project using **authoring tools**.

- These software tools are designed to manage individual multimedia elements and provide user interaction. **Integrated multimedia** is the "weaving" part of the multimedia definition, where source documents such as montages, graphics, video cuts, and sounds merge into a final presentation.

WHERE TO USE MULTIMEDIA

- Multimedia is appropriate whenever a human user is connected to electronic information of any kind, at the "human interface.":
  - **Business**: presentations, training, marketing, advertising, product demos, simulations, databases, catalogs, instant messaging, and networked communications.
  - **Education**: tutorials, courses demo, e-learning, ITV (interactive TV).
  - **Home**: gardening, cooking, home design, remodeling, repair and, genealogy software.
  - **Public places**: In hotels, train stations, shopping malls, museums, libraries, and grocery stores, multimedia is already available at stand-alone terminals or kiosks, providing information and help for customers.

- **Virtual Reality**: At the convergence of technology and creative invention in multimedia is virtual reality, or VR.

VIRTUAL REALITY

- Virtual reality (VR) is an extension of multimedia—and it uses the basic multimedia elements of imagery, sound, and animation. Because it requires instrumented feedback from a wired-up person, VR is perhaps interactive multimedia at its fullest extension.

- **VR** is an interactive computer-generated experience taking place within a simulated environment. It incorporates mainly auditory and visual feedback, but may also allow other types of sensory feedback. This immersive environment can be similar to the real world or it can be fantastical.

AUGMENTED REALITY

- **Augmented reality** (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are "**augmented**" by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory, and olfactory.
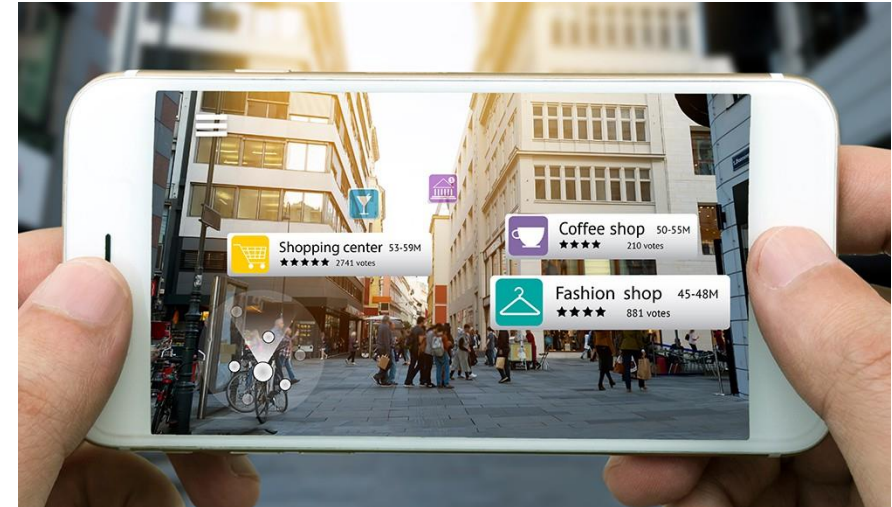
Delivering multimedia

- Multimedia requires large amounts of digital memory when stored in an end user's library, or large amounts of **bandwidth** when distributed over wires, glass fiber, or airwaves on a network. The greater the bandwidth, the bigger the pipeline, so more content can be delivered to end users quickly.

- CD-ROM and DVD are used to distribute multimedia products of limited capacity. However, in the last years these media are being replaced by other using new technology such as flash drives and thumb drives that do not require moving parts.
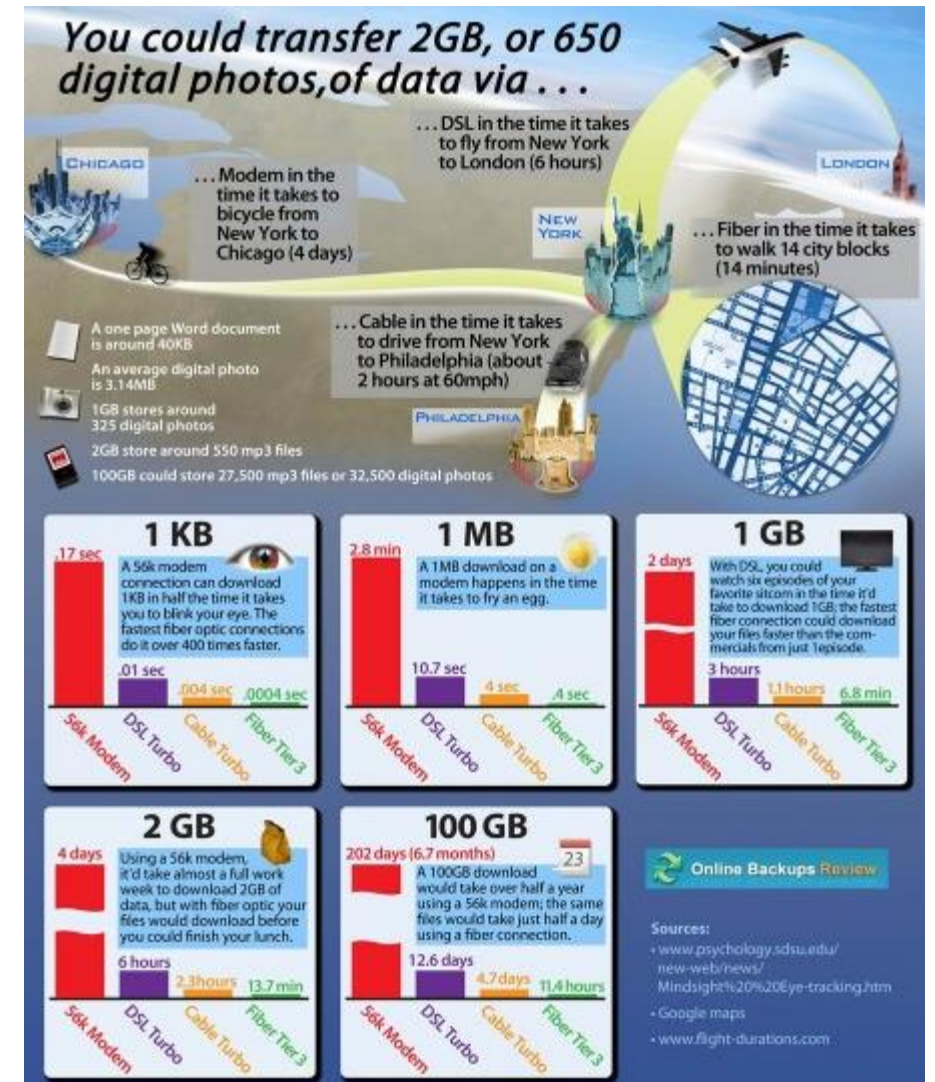
ACTIVITY #1

- Usted tiene la tarea de crear una presentación Web interactiva para la venta de una bicicleta nueva. Visite 4 diferentes sitios Web utilizando una herramienta de búsqueda adecuada. Para cada sitio Web que visite, escriba en la tabla siguiente el nombre del sitio, su URL, plataformas en las cuales se puede visualizar el Web, y:
  1. Describa cada sitio en términos de la incorporación de elementos multimedia
  2. Discuta si su contenido multimedia es apropiado y donde y como algún contenido multimedia adicional podría mejorar el sitio
  3. Describa que formatos de presentación multimedia utiliza: video?, realidad virtual? Animaciones 3D?

| Site 1	
URL (address):	
Describe the GUI. What navigational elements does it have? What colors does it use? Is it cluttered?	
Is the content relevant and appropriate? What additions/deletions of content might improve the site?	
Describe any multimedia presentations of specific products. What formats did they use?	
Site 2	
URL (address):	
Describe the GUI. What navigational elements does it have? What colors does it use? Is it cluttered?	
Describe any multimedia presentations of specific products. What formats did they use?	
Site 3	
URL (address):	
Describe the GUI. What navigational elements does it have? What colors does it use? Is it cluttered?	
Describe any multimedia presentations of specific products. What formats did they use?	
Site 4	
URL (address):	
Describe the GUI. What navigational elements does it have? What colors does it use? Is it cluttered?	
Describe any multimedia presentations of specific products. What formats did they use?	
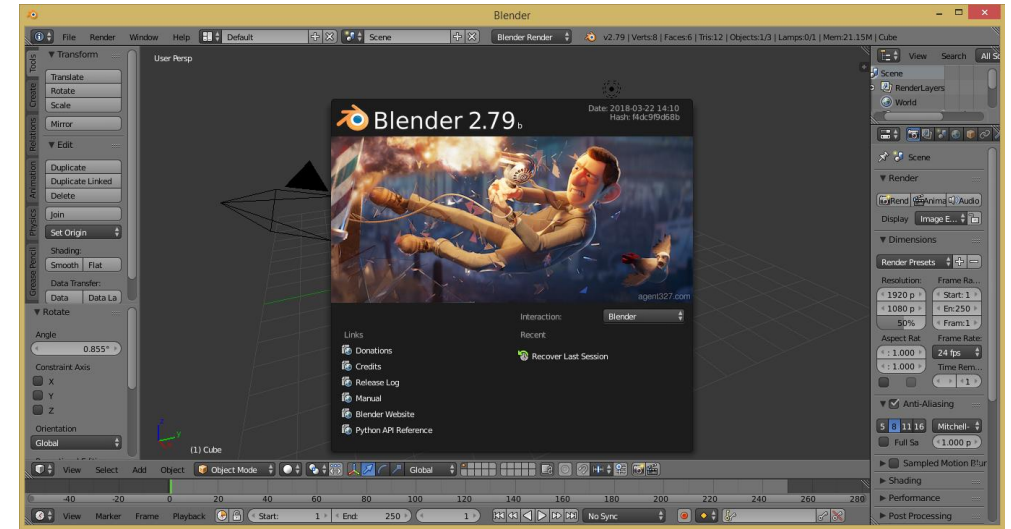
MULTIMEDIA ELEMENTS

CHAPTER 1: INTRODUCTION

MULTIMEDIA ELEMENTS
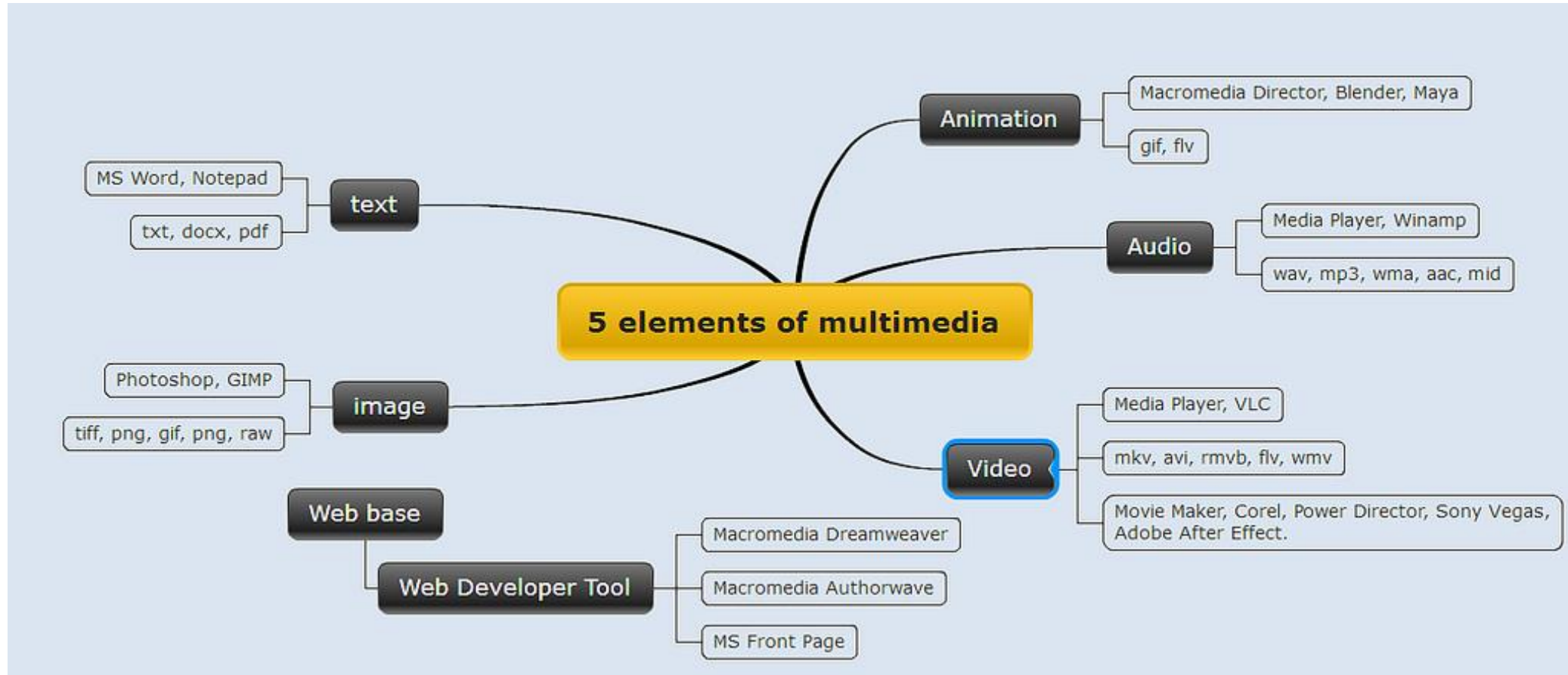
TEXT

MULTIMEDIA ELEMENTS

Schriftbild

Schriftbild

Schriftbild

𝕾𝖈𝖍𝖗𝖎𝖋𝖙𝖇𝖎𝖑𝖉

Schriftbild

TEXT

- Today, text and the ability to read it are doorways to power and knowledge.

- Reading and writing are expected and necessary skills within most modern cultures.

- As has been the case throughout history, text still delivers information that can have potent meaning.

- Since the explosion of the Internet and the World Wide Web, text has become more important than ever. Indeed, the native language of the Web is HTML (Hypertext Markup Language), originally designed to display simple text documents on computer screens, with occasional graphic images thrown in as illustrations.

- Academic papers, magazine articles, complex instruction manuals, and even the contents of entire books are now available for reading with a web browser.

TEXT

- Who is the audience? What words should I use? What typeface is best?

- Even a single word may be cloaked in many meanings, so as you begin working with text, it is important to cultivate accuracy and conciseness in the specific words you choose. In multimedia, these are the words that will appear in your titles, menus, and navigation aids as well as in your narrative or content.

- Multimedia authors weave words, symbols, sounds, and images, and then blend text into the mix to create integrated tools and interfaces for acquiring, displaying, and disseminating messages and data.

TEXT

- It's important to design labels for title screens, menus, and buttons or tabs using words that have the most precise and powerful meanings to express what you need to say.

- If you have the budget, set up a focus group to have potential users experience your words. Watch them work. See if users flinch, balk, or click the Help button in confusion. See if they can even find the Help button.

- Words and symbols in any form, spoken or written, are the most common system of communication. They deliver the most widely understood meaning to the greatest number of people—accurately and in detail. Because of this, they are vital elements of multimedia menus, navigation systems, keyword lists, and content.

IMAGE

MULTIMEDIA ELEMENTS

IMAGE

- An image is an important part of a multimedia system. The images give a lot of information to the users. When the interface of a multimedia system is designed, depending on the authoring tool used in the development process, images of one format or another may be included.

- On the other hand, an image can be included through some option of the tool or, in some cases, the same tool has some component to produce the image.

IMAGE

- Most authoring systems provide the tools with which you can create the graphic objects of multimedia (text, interactive buttons, vector-drawn objects, and bitmaps) directly on your screen. If one of these tools is not included, the authoring system usually offers a mechanism for importing the object you need from another application.

- When you are working with animated objects or motion video, most authoring systems include a feature for activating these elements, such as a programming language or special functions for embedding them. Likely, too, your tools will offer a library of special effects—including zooms, wipes, and dissolves. Many multimedia designers do not limit their toolkits to the features of a single authoring platform, but employ a variety of applications and tools to accomplish many specialized tasks.

IMAGE

- Models or methodologies used to specify colors in computer terms are RGB, **HSB**, **HSL**, CMYK, **CIE**, and others.

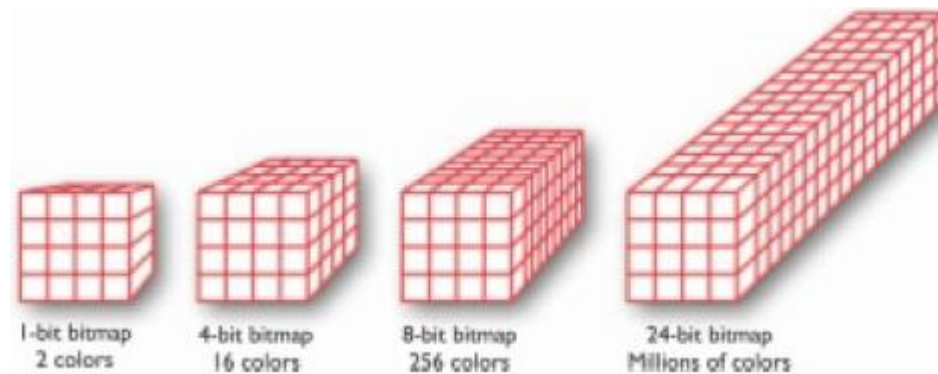| RGB Combination (R,G,B)	Perceived Color
Red only (255,0,0)	Red
Green only (0,255,0)	Green
Blue only (0,0,255)	Blue
Red and green (blue subtracted) (255,255,0)	Yellow
Red and blue (green subtracted) (255,0,255)	Magenta
Green and blue (red subtracted) (0,255,255)	Cyan
Red, green, and blue (255,255,255)	White
None (0,0,0)	Black

IMAGE

- In the HSB (hue, saturation, brightness) and HSL (hue, saturation, lightness) models, you specify hue or color as an angle from 0 to 360 degrees on a color wheel, and saturation, brightness, and lightness as percentages.

- Saturation is the intensity of a color. At 100 percent saturation a color is pure; at 0 percent saturation, the color is white, black, or gray. Lightness or brightness is the percentage of black or white that is mixed with a color. A lightness of 100 percent will yield a white color; 0 percent is black; the pure color has a 50 percent lightness.

Color	Degrees
Red	0°
Yellow	60°
Green	120°
Cyan	180°
Blue	240°
Magenta	300°

IMAGE

- A bitmap is a data matrix that describes the characteristics of all the pixels making up an image. Here, each cube represents the data required to display a 4 × 4–pixel image (the face of the cube) at various color depths (with each cube extending behind the face indicating the number of bits— zeros or ones—used to represent the color for that pixel).

1-bit bitmap
2 colors

4-bit bitmap
16 colors

8-bit bitmap
256 colors

24-bit bitmap
Millions of colors

IMAGE

- Most applications on any operating system can manage JPEG, GIF, PNG, and TIFF image formats.

- JPEG, PNG, and GIF images are the most common bitmap formats used on the Web and may be considered cross-platform, as all browsers will display them.

- Other formats are: TIFF, BMP, DXF.
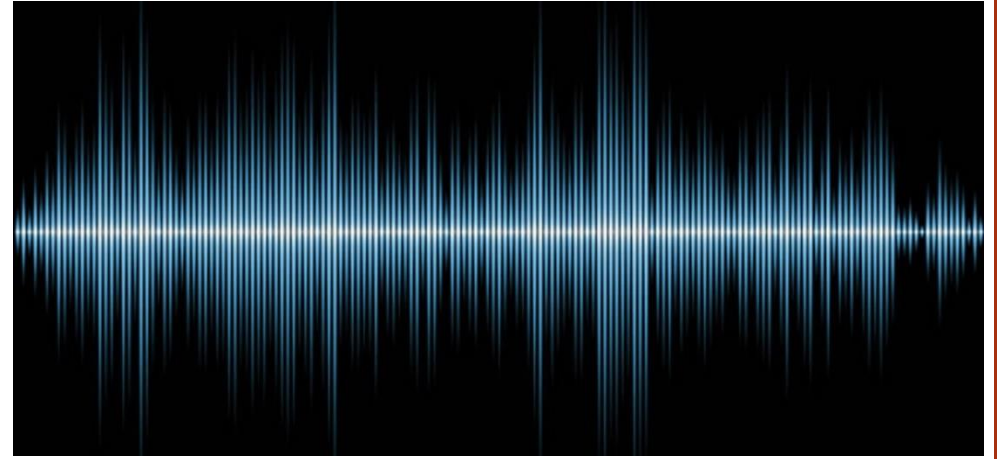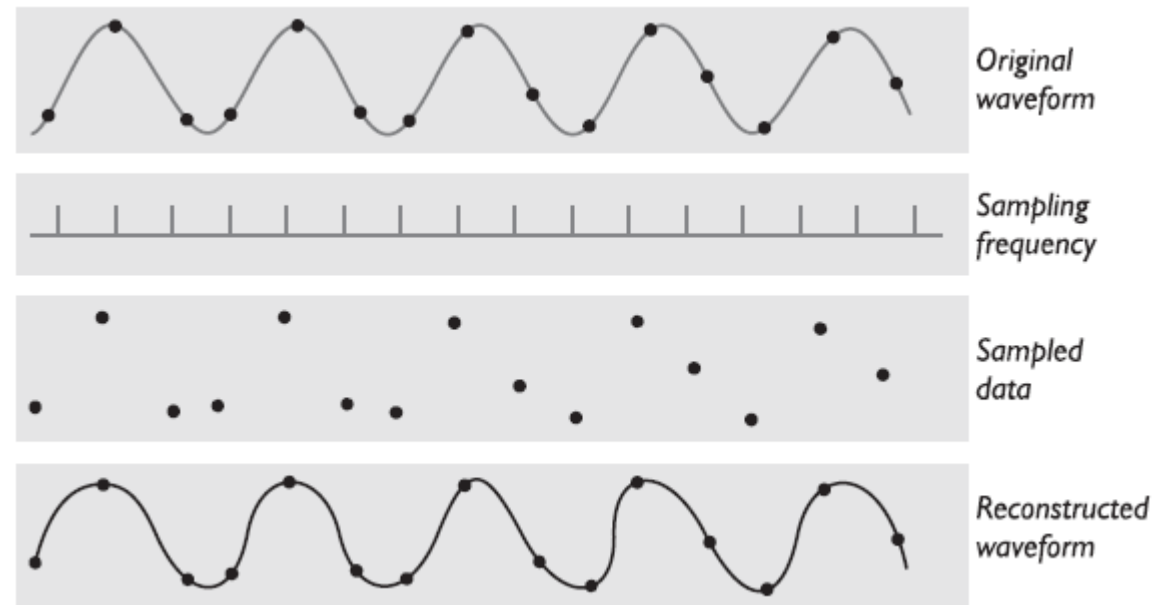
SOUND

MULTIMEDIA ELEMENTS

SOUND

- How you use the power of sound can make the difference between an ordinary multimedia presentation and a professionally spectacular one.

- Misuse of sound, however, can wreck your Project.

DIGITAL AUDIO

- **Digital audio** is created when you represent the characteristics of a sound wave using numbers—a process referred to as digitizing. You can digitize sound from a microphone, a synthesizer, existing recordings, live radio and television broadcasts, and popular CD and DVDs. In fact, you can digitize sounds from any natural or prerecorded source.

- Digitized sound is sampled sound. Every *n*th fraction of a second, a **sample** of sound is taken and stored as digital information in bits and bytes. The quality of this digital recording depends upon how often the samples are taken (**sampling rate** or frequency, measured in kilohertz, or thousands of samples per second) and how many numbers are used to represent the value of each sample (**bit depth**, **sample size**, resolution, or dynamic range).

DIGITAL AUDIO

- The three sampling rates most often used in multimedia are 44.1 kHz (**CD-quality**), 22.05 kHz, and 11.025 kHz. Sample sizes are either 8 bits or 16 bits. The larger the sample size, the more accurately the data will describe the recorded sound.

Original waveform

Sampling frequency

Sampled data

Reconstructed waveform

DIGITAL AUDIO

- You should focus on two crucial aspects of preparing digital audio files:
  - Balancing the need for sound quality against file size. Higher quality usually means larger files, requiring longer download times on the Internet and more storage space on a CD or DVD.
  - Setting proper recording levels to get a good, clean recording.

- The **sampling rate** determines the frequency at which samples will be taken for the recording. Sampling at higher rates (such as 44.1 kHz or 22.05 kHz) more accurately captures the high-frequency content of your sound.

- **Audio resolution** (such as 8- or 16-bit) determines the accuracy with which a sound can be digitized. Using more bits for the sample size yields a recording that sounds more like its original.

DIGITAL AUDIO

- Here are the formulas for determining the size (in bytes) of a digital recording. For a monophonic recording:
  - sampling rate * duration of recording in seconds * (bit resolution / 8) * 1

- For a stereo recording:
  - sampling rate * duration of recording in seconds * (bit resolution / 8) * 2

MIDI Audio

- (Musical Instrument Digital Interface) is a communications standard developed in the early 1980s for electronic musical instruments and computers.

- It allows music and sound synthesizers from different manufacturers to communicate with each other by sending messages along cables connected to the devices.

- MIDI provides a protocol for passing detailed descriptions of a musical score, such as the notes, the sequences of notes, and the instrument that will play these notes. But MIDI data is not digitized sound; it is a shorthand representation of music stored in numeric form.
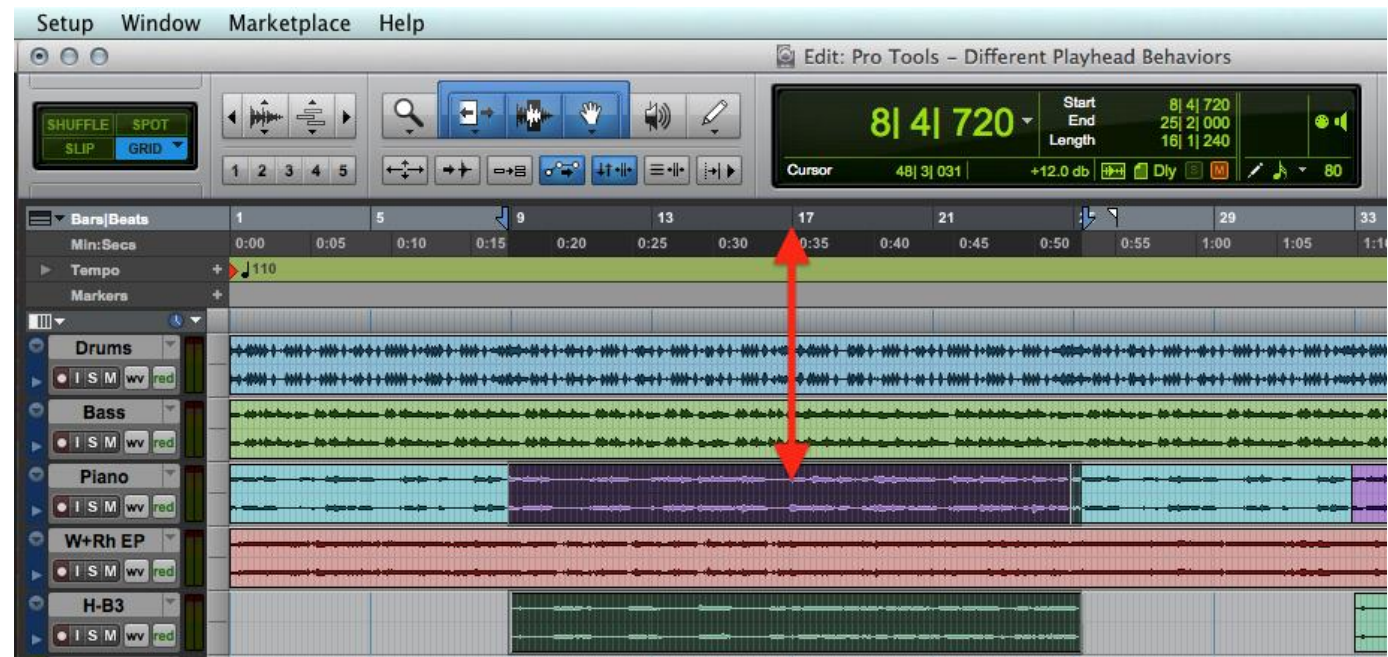
MIDI: ADVANTAGES

- MIDI has several advantages over digital audio and two huge disadvantages.

- First, the advantages:
  - MIDI files are much more compact than digital audio files, and the size of a MIDI file is completely independent of playback quality. Because MIDI files are small, they don't take up as much memory, disk space, or bandwidth.
  - Because they are small, MIDI files embedded in web pages load an play more quickly than their digital equivalents.
  - In some cases, if the MIDI sound source you are using is of high quality
  - MIDI files may sound better than digital audio files.
  - You can change the length of a MIDI file (by varying its tempo) without changing the pitch of the music or degrading the audio quality.
  - MIDI data is completely editable—right down to the level of an individual note. You can manipulate the smallest detail of a MIDI composition in ways that are impossible with digital audio.
  - Because they represent the pitch and length of notes, MIDI files can generally be converted to musical notation, and vice versa. This is useful when you need a printed score; in reverse, you can scan a printed score and convert it to MIDI for tweaking and editing.

MIDI: DISADVANTAGES

- The disadvantages are:
  - Because MIDI data does not represent sound but musical instruments, you can be certain that playback will be accurate only if the MIDI playback device is identical to the device used for production. Even with the General MIDI standard, the sound of a MIDI instrument varies according to the electronics of the playback device and the sound generation method it uses.
  - Also, MIDI cannot easily be used to play back spoken dialog, although expensive and technically tricky digital samplers are available.

WHEN TO USE MIDI FORMAT

- In general, use MIDI in the following circumstances:
  - Digital audio won't work because you don't have enough memory or bandwidth.
  - You have a high-quality MIDI sound source.
  - You have complete control over the machines on which your program will be delivered, so you know that your users will have high-quality MIDI playback hardware.
  - You don't need spoken dialog.

DIGITAL AUDIO: ADVANTAGES

- The most important advantage of digital audio is its consistent playback quality, but this is where MIDI is the least reliable! With digital audio you can be more confident that the audio track for your multimedia project will sound as good in the end as it did in the beginning when you created it. For this reason, it's no surprise that digital audio is used far more frequently than MIDI data for multimedia sound delivery.

- There are two additional and often more compelling reasons to work with digital audio:
  - A wider selection of application software and system support for digital audio is available for both the Macintosh and Windows platforms.
  - The preparation and programming required for creating digital audio do not demand knowledge of music theory, while working with MIDI data usually does require a modicum of familiarity with musical scores, keyboards, and notation, as well as audio production.

WHEN TO USE DIGITAL AUDIO

- In general, use digital audio in the following circumstances:
  - You don't have control over the playback hardware.
  - You have the computing resources and bandwidth to handle digital files.
  - You need spoken dialog

COPYRIGHT ISSUES

- Ownership rights are significant issues for multimedia producers who would love to use a few bars of Beyonce's latest hit or a nostalgic background of Bach suites played by Pablo Casals. Producers may rightfully fret about copyrights and permissions. Most developers play it safe by always making their own custom music from scratch in a sound studio, or with synthesizers, or by using sounds that have a clear and paid-for ownership and permission trail. Others simply take a risk and break the law.
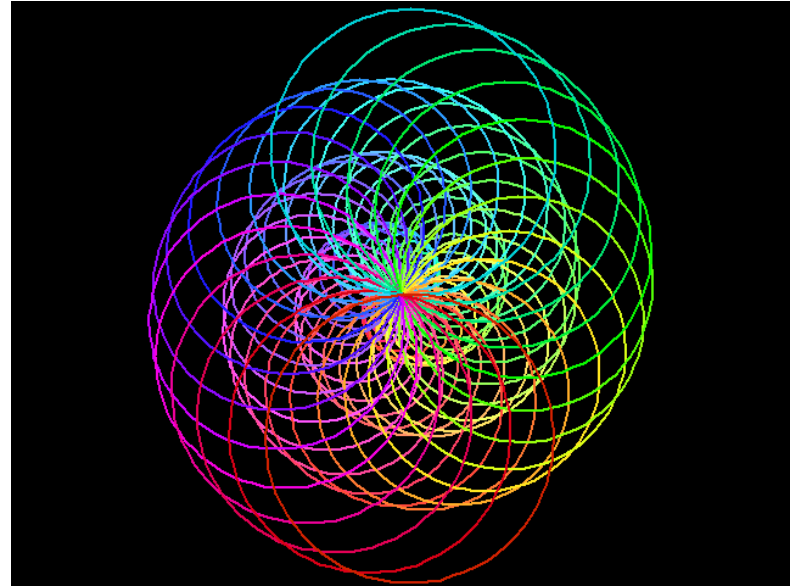
ANIMATION

MULTIMEDIA ELEMENTS

ANIMATION

- By definition, **animation** makes static presentations come alive. It is visual change over time and can add great power to your multimedia projects and web pages. Many multimedia applications for both Macintosh and Windows provide animation tools.

- For a brief product demonstration with little user interaction, it might make sense to design the entire project as a video and keep the presentation always in motion.

- Visual effects such as wipes, fades, zooms, and dissolves are available in most multimedia authoring packages, and some of these can be used for primitive animation.

ANIMATION

- But animation is more than wipes, fades, and zooms. Animation is an object actually moving across or *into* or *out of* the screen; a spinning globe of our earth; a car driving along a line-art highway; a bug crawling out from under a stack of papers, with a screaming voice from the speaker telling you to "Shoot it, now!".

- Until video became more commonplace, animations were the primary source of dynamic action in multimedia presentations.

- *Overuse of animation and annoying visual effects can ruin a multimedia project.*
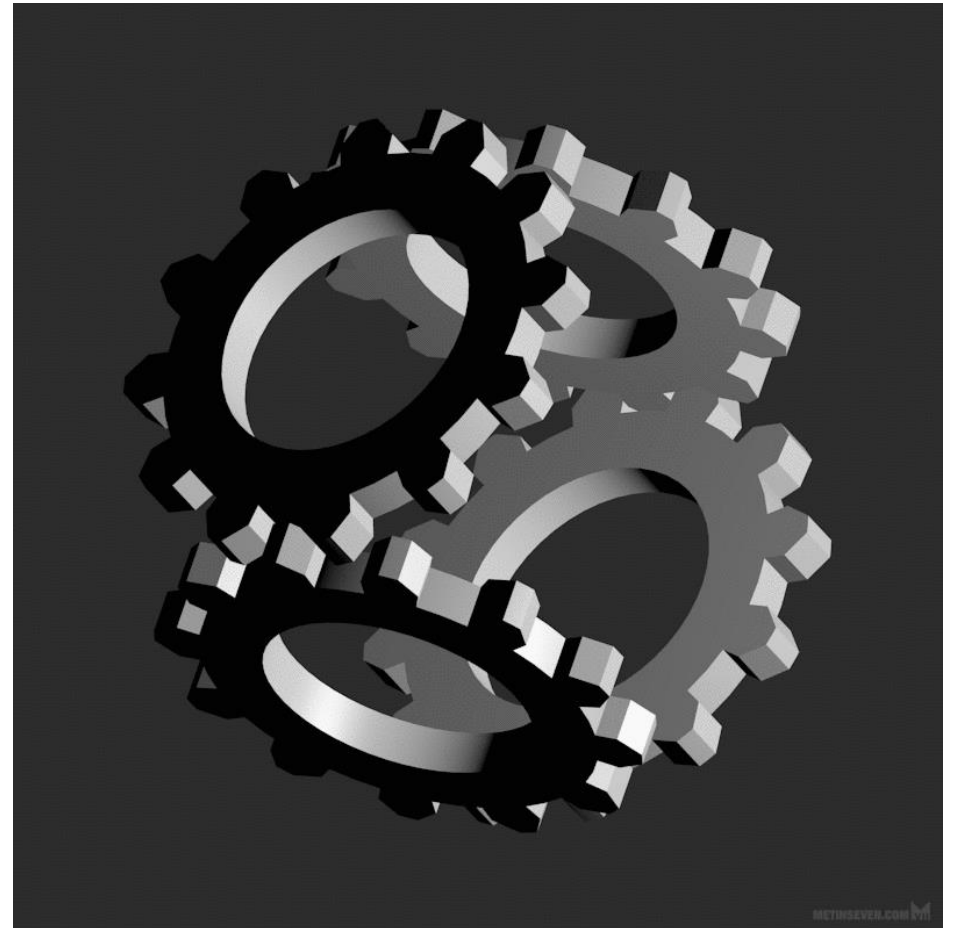
ANIMATION

- Animation is possible because of a biological phenomenon known as **persistence of vision** and a psychological phenomenon called **phi**.

- An object seen by the human eye remains chemically mapped on the eye's retina for a brief time after viewing. Combined with the human mind's need to conceptually complete a perceived action, this makes it possible for a series of images that are changed very slightly and very rapidly, one after the other, to seemingly blend together into a visual illusion of movement.
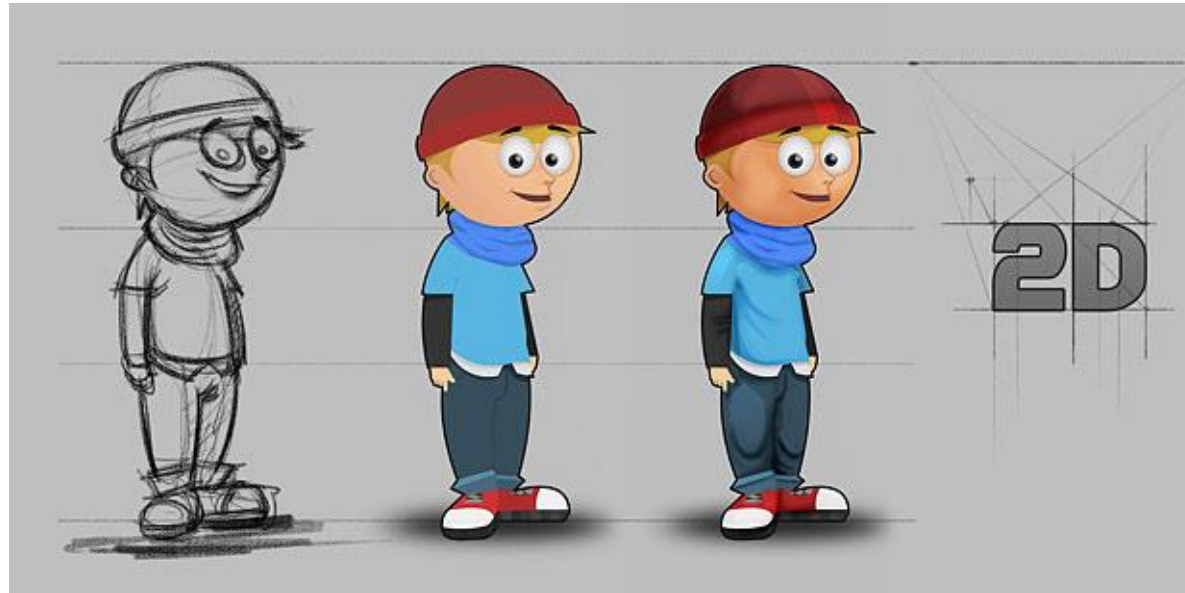
ANIMATION

- Using appropriate software and techniques, you can animate visual images in many ways. The simplest animations occur in two-dimensional (2-D) space; more complicated animations occur in an intermediate "2½-D" space (where shadowing, highlights, and forced perspective provide an illusion of depth, the third dimension); and the most realistic animations occur in three-dimensional (3-D) space.

2-D ANIMATION

- In 2-D space, the visual changes that bring an image alive occur on the flat Cartesian x and y axes of the screen. A blinking word, a **color-cycling** logo (where the colors of an image are rapidly altered according to a formula), a cel animation, or a button or tab that changes state on mouse rollover to let a user know it is active are all examples of **2-D animations**.

2$^{1/2}$ –D ANIMATION

- In **2½-D animation**, an illusion of depth (the z axis) is added to an image through shadowing and highlighting, but the image itself still rests on the flat x and y axes in two dimensions.

- Embossing, shadowing, beveling, and highlighting provide a sense of depth by raising an image or cutting it into a background.

3–D ANIMATION

- In **3-D animation**, software creates a virtual realm in three dimensions, and changes (motion) are calculated along all three axes (x, y, and z), allowing an image or object that itself is created with a front, back, sides, top, and bottom to move toward or away from the viewer, or, in this virtual space of light sources and points of view, allowing the viewer to wander around and get a look at all the object's parts from all angles.

VIDEO

MULTIMEDIA ELEMENTS

VIDEO

- Digital video is the most engaging of multimedia venues, and it is a powerful tool for bringing computer users closer to the real world. It is also an excellent method for delivering multimedia to an audience raised on television.

- With video elements in your project, you can effectively present your messages and reinforce your story, and viewers tend to retain more of what they see. But take care! Video that is not thought out or well produced can degrade your presentation.

VIDEO

- Carefully planned, well-executed video-clips can make a dramatic difference in a multimedia project.

- Before deciding whether to add video to your project, however, it is essential to have an understanding of the medium, its limitations, and its costs.

- Of all the multimedia elements, video places the highest performance demand on your computer or device—and its memory and storage.