

Computer Science E-I

Lecture 5: Multimedia

Exam I

[http://www.cnn.com/2013/03/10/
tech/web/grumpy-cat-sxsw](http://www.cnn.com/2013/03/10/tech/web/grumpy-cat-sxsw)

[http://www.theonion.com/video/
youtube-contest-challenges-users-
to-make-a-good-vi,14288/](http://www.theonion.com/video/youtube-contest-challenges-users-to-make-a-good-vi,14288/)

Multimedia

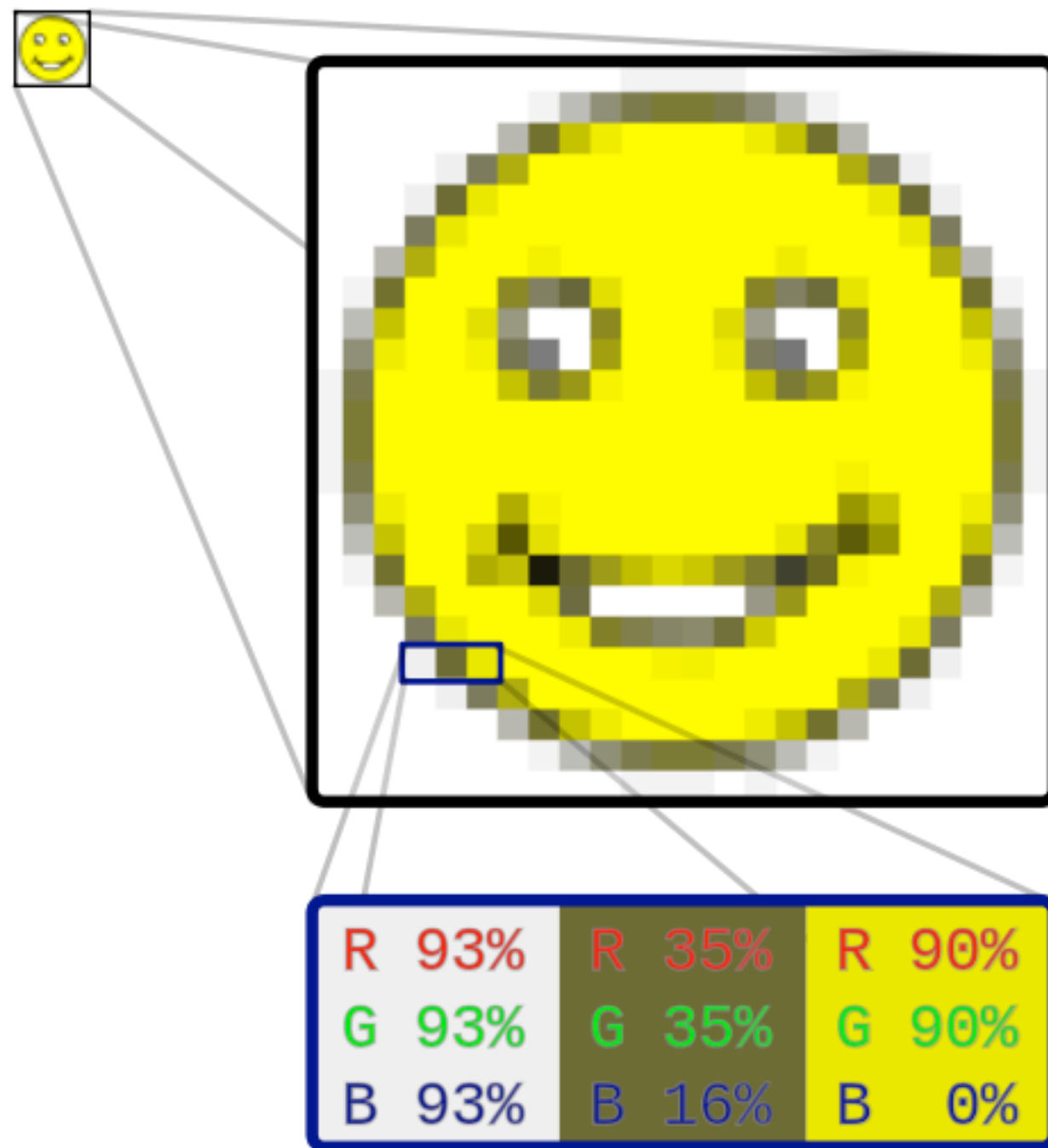
File Formats

<http://download.microsoft.com/download/0/B/E/0BE8BDD7-E5E8-422A-ABFD-4342ED7AD886/Word97-2007BinaryFileFormat%28doc%29Specification.pdf>

Interpreting Bits

Raster Graphics

Pixels



Colors

Additive Color Mixing



Color Depth

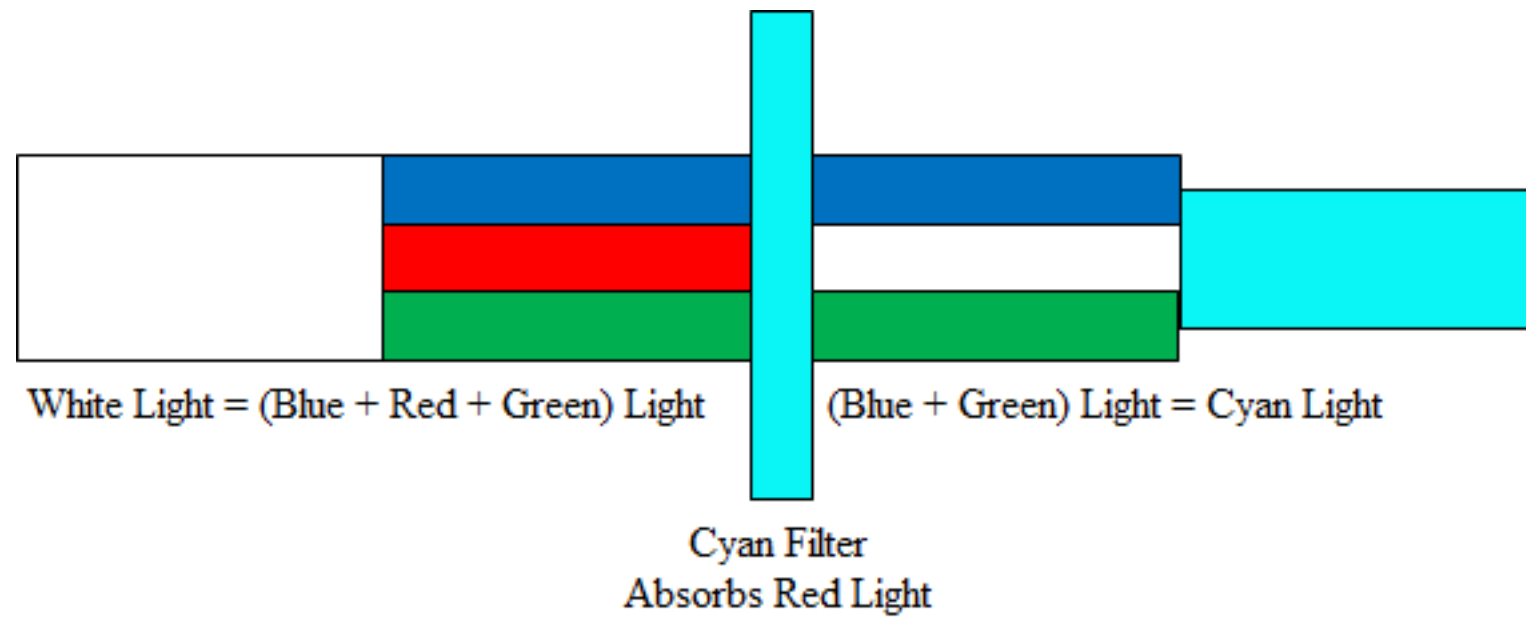
RGB

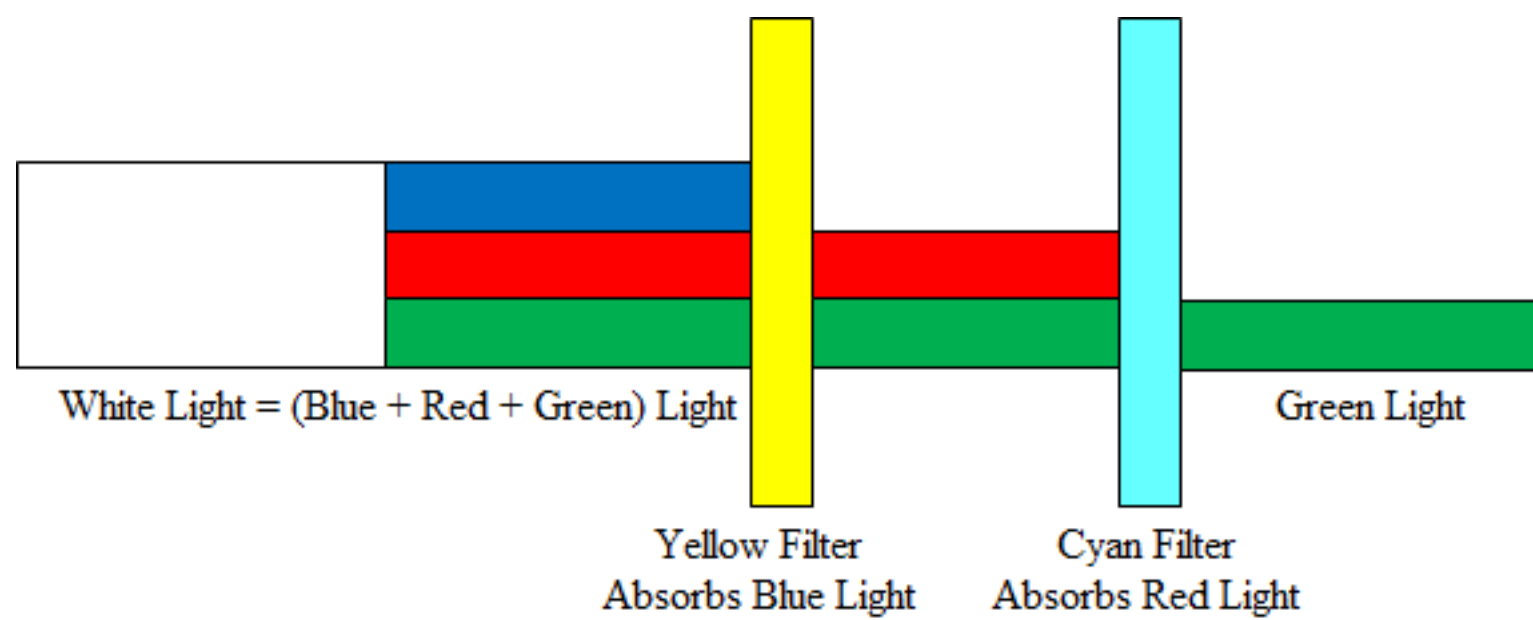
#FF0000

#0088FF

[http://www.html-color-names.com/
color-chart.php](http://www.html-color-names.com/color-chart.php)

Subtractive Color Mixing





CMYK

Bitmaps

Magic Numbers

0x42 0x4D

Metadata



xxd

Resolution

16x16



32x32



128x128



512x512

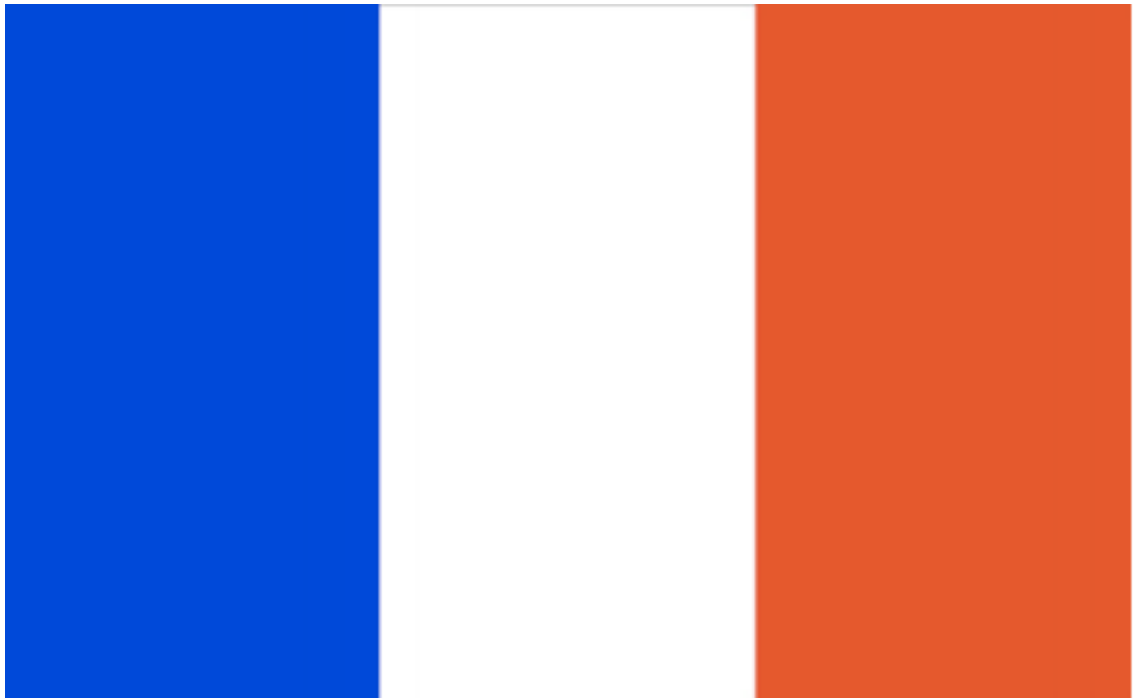


<http://www.youtu.be/Vxq9yj2pVWk>

Compression

Lossless Compression





Lossy Compression

Hey wat r u doin tmrw? I wntd 2
go 2 c Ben.

Hey, what are you doing
tomorrow? I wanted to
go see Ben.

JPEG





Alpha

Animated GIFs

<http://whatshouldwecallme.tumblr.com/>

Name	Extension	Compression	Color	Alpha
Bitmap	.bmp	No	24-bit	No
GIF	.gif	Lossless	8-bit	No
JPEG	.jpg, .jpeg	Lossy	24-bit	No
PNG	.png	Lossless	24-bit	Yes

Vector Graphics

<http://en.wikipedia.org/wiki/>

File:Virtual Private Network over
view.svg

Icon Fonts

[http://fontawesome.github.com/](http://fontawesome.github.com/Font-Awesome/)
Font-Awesome/

Seam Carving



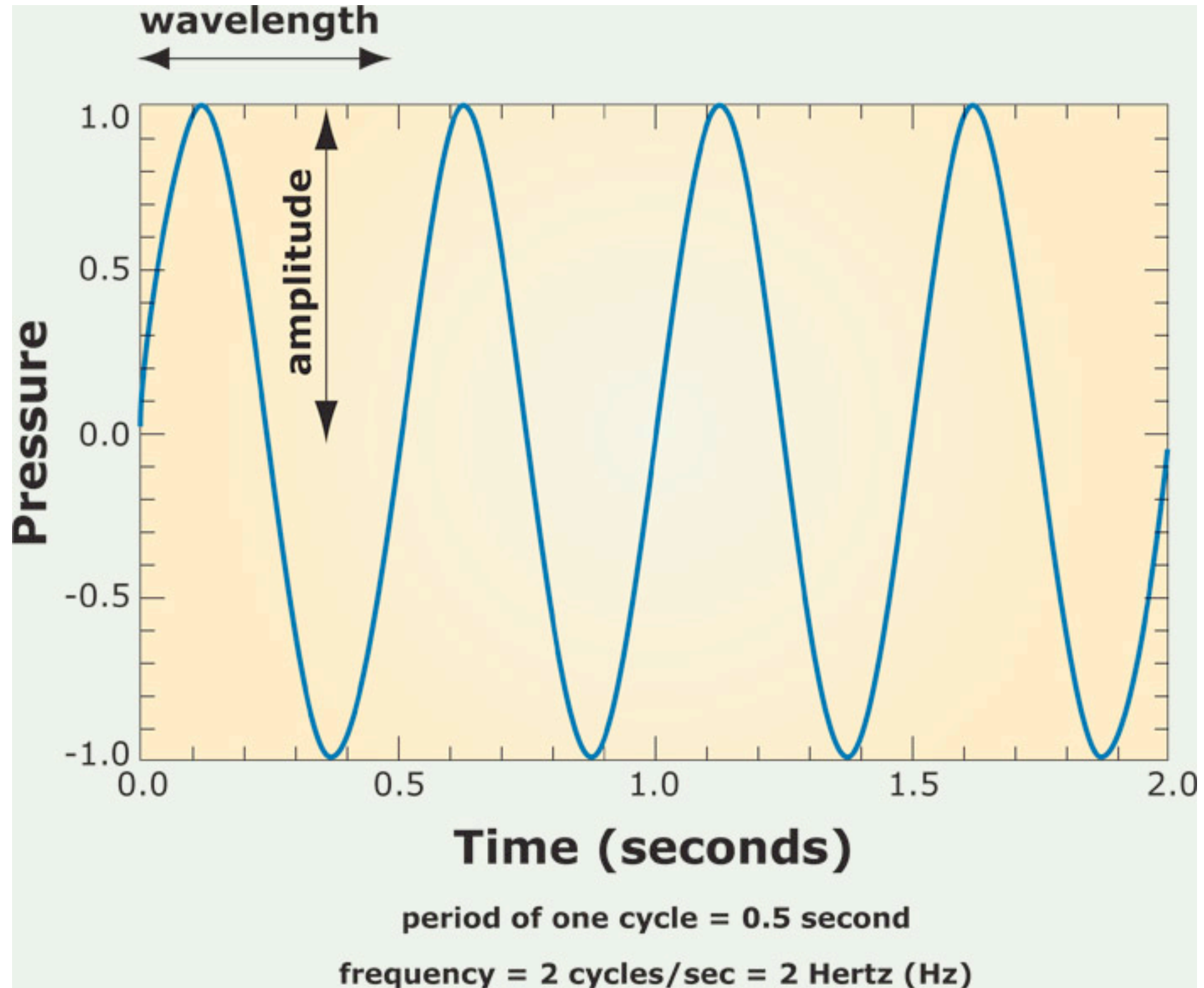


Energy





Sound

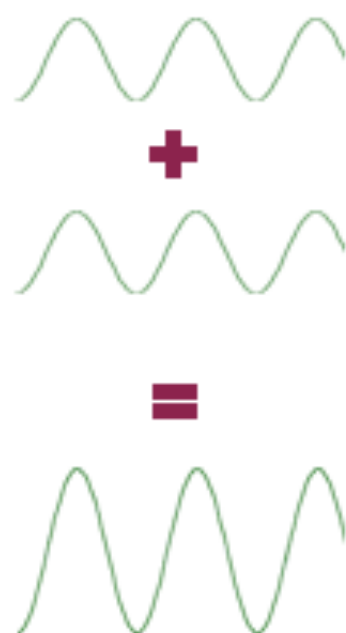


Amplitude

Wavelength

Interference

In Phase
Waves add together



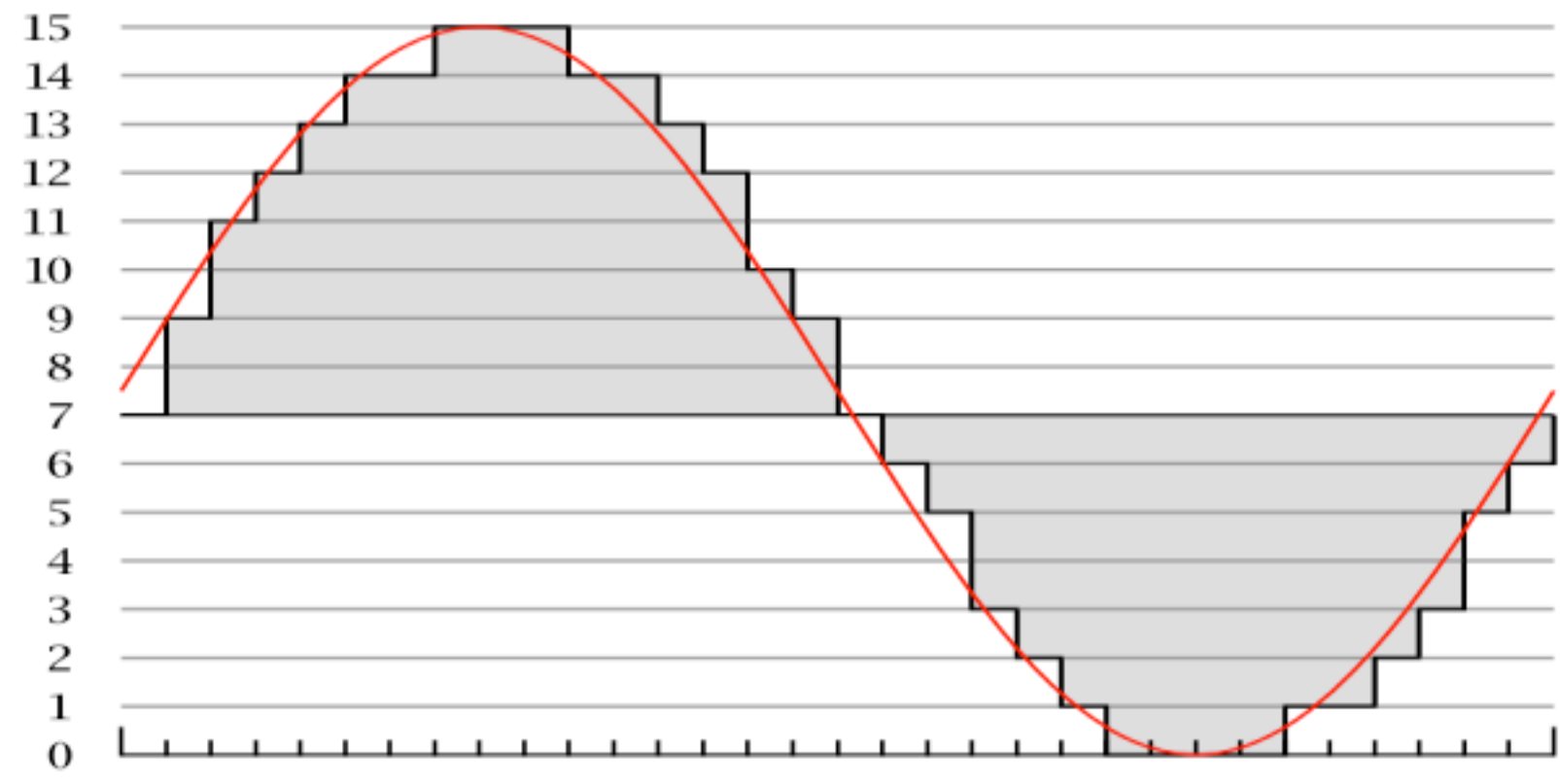
180° Out of Phase
Waves cancel each other



Different Waves
New wave created



Analog to Digital



Sampling Rate



Analog Signal



Digital Signal at 64 kbps



Digital Signal at 128 kbps

Bitrate

MP3

PCM

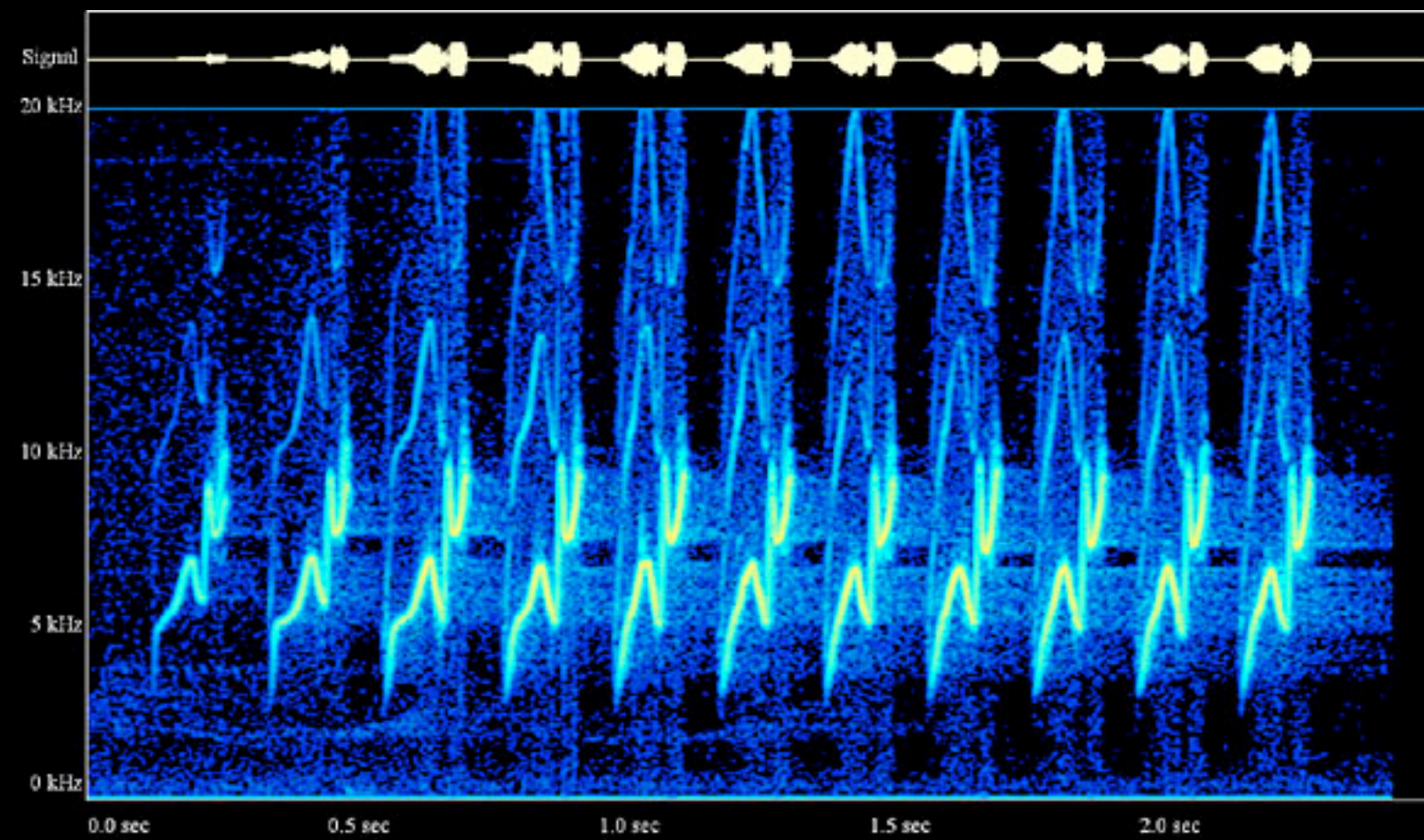
Psychoacoustics

20 Hz - 20 kHz

Frequency Masking

Fast Fourier Transform

Spectrogram



Frames

ID3

Audio Formats

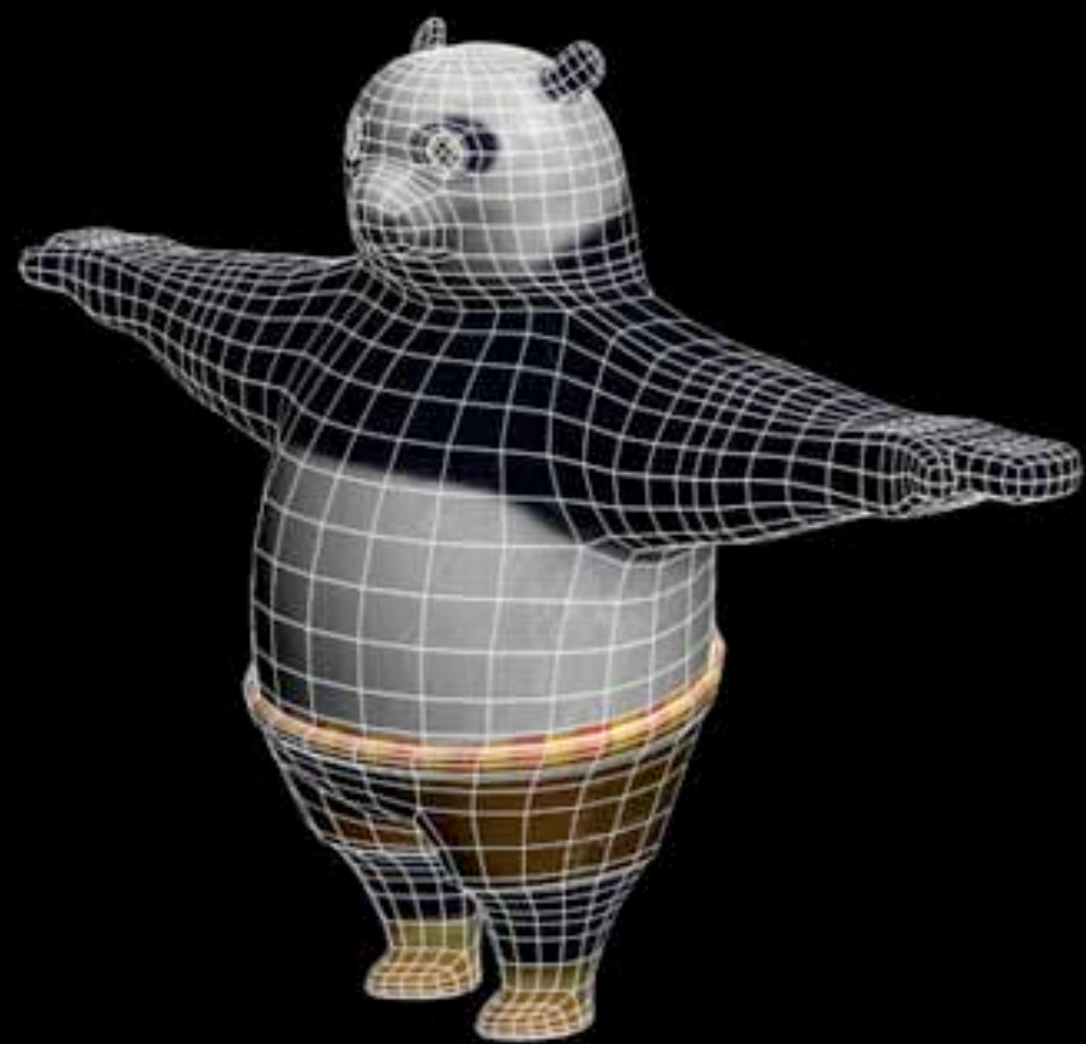
Audio Formats

- AAC
- MIDI
- MP3
- WAV
- WMA

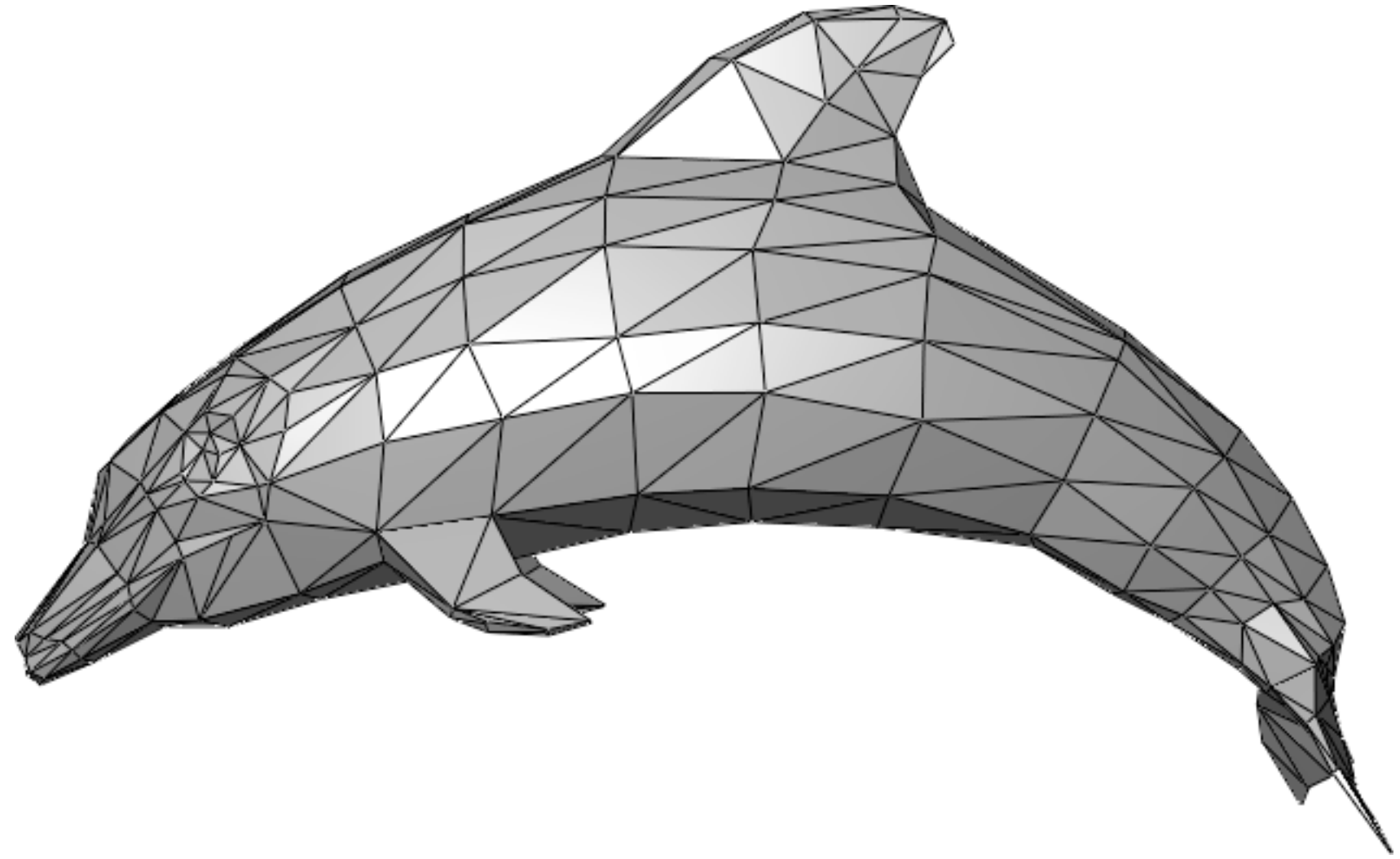
Audacity

3D Graphics

Wireframe

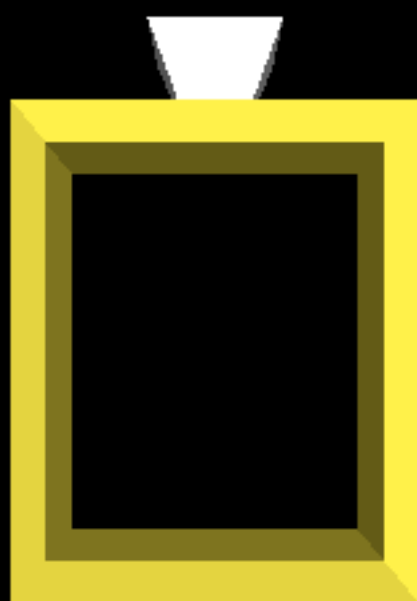


Polygon Mesh



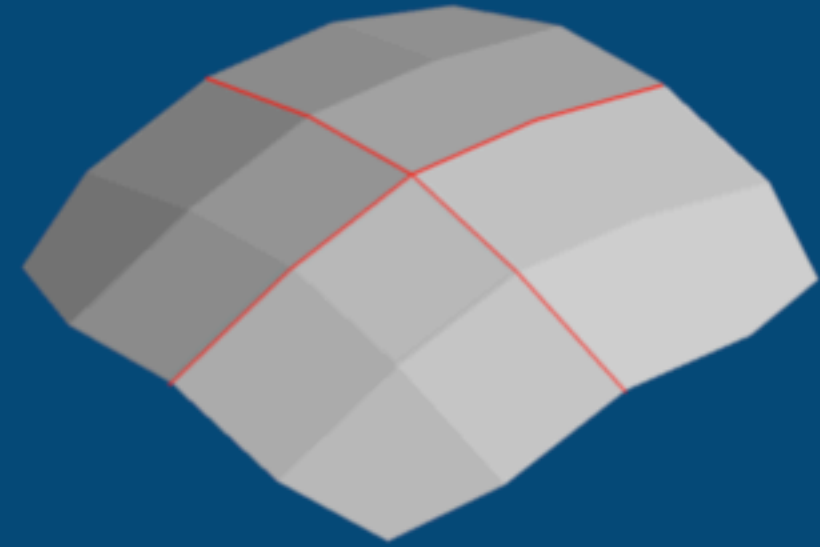
Subdivision

[http://www.subdivision.org/demos/
demos.html](http://www.subdivision.org/demos/demos.html)

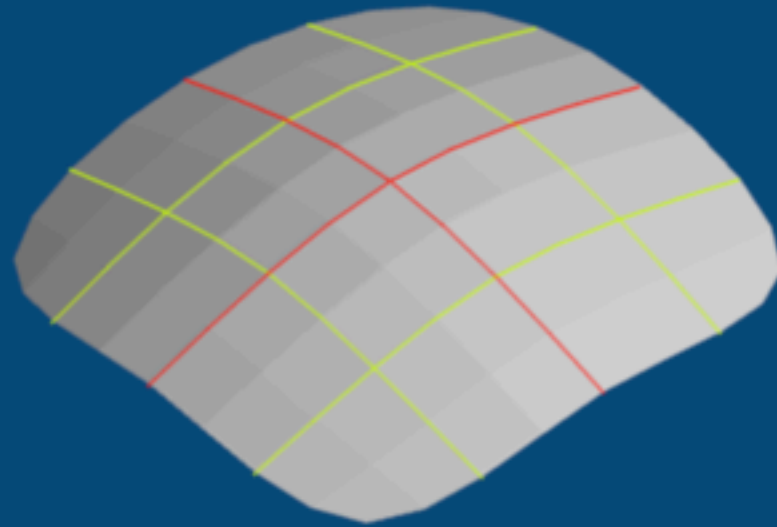




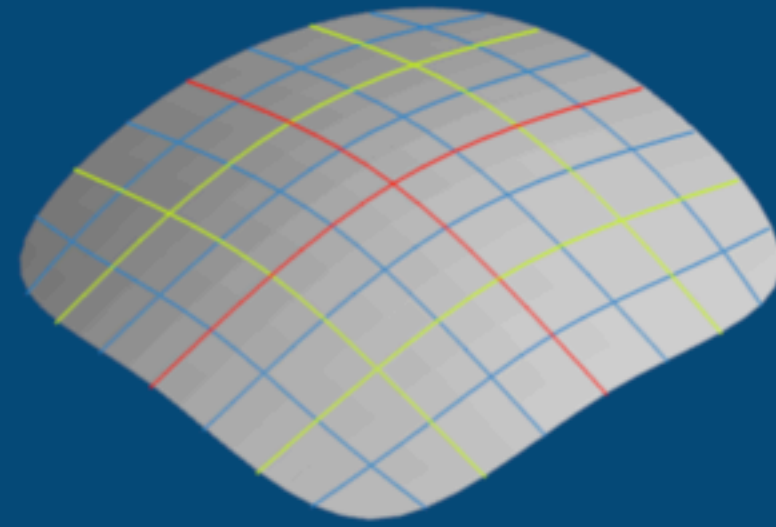
a



b



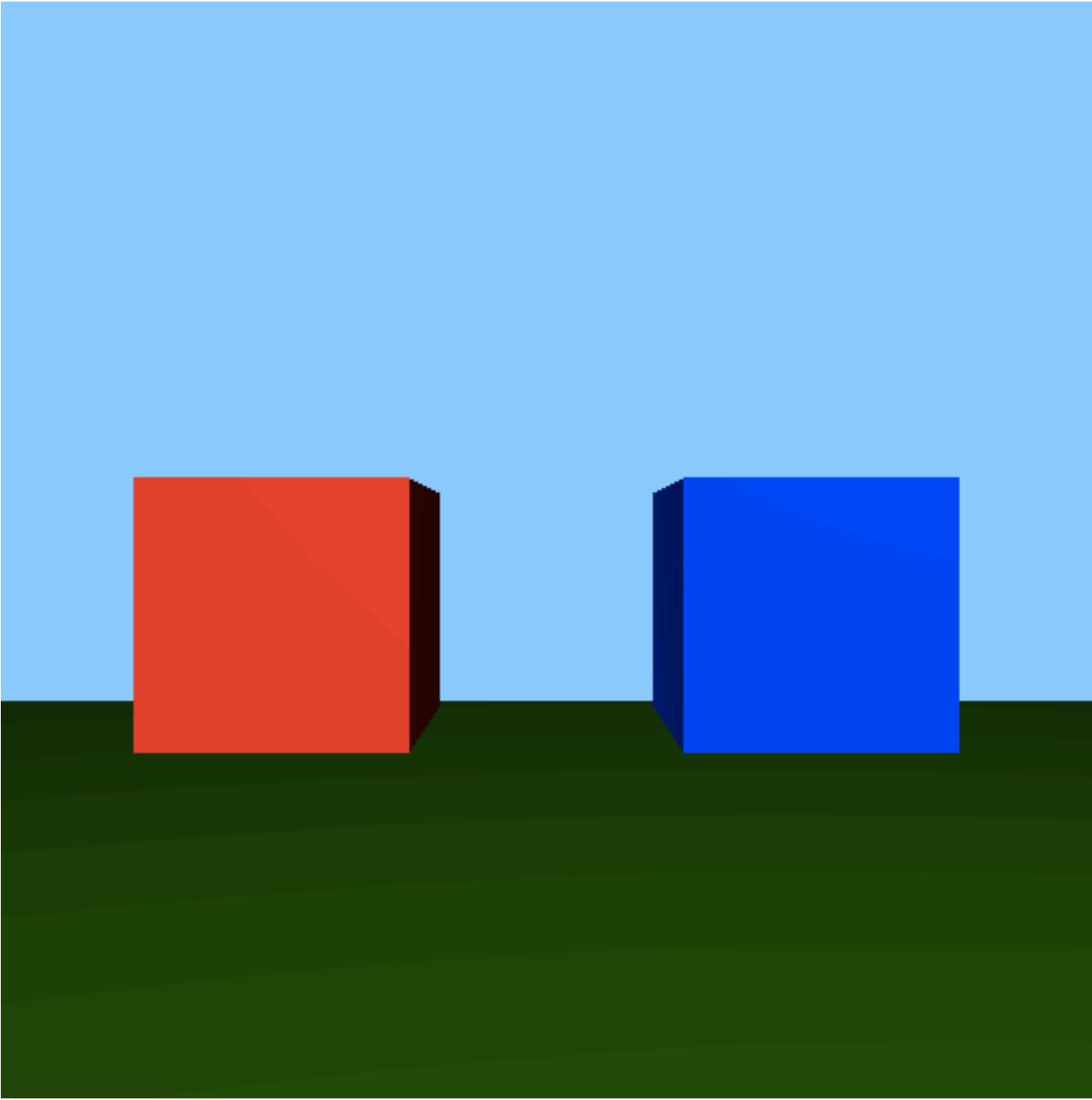
c

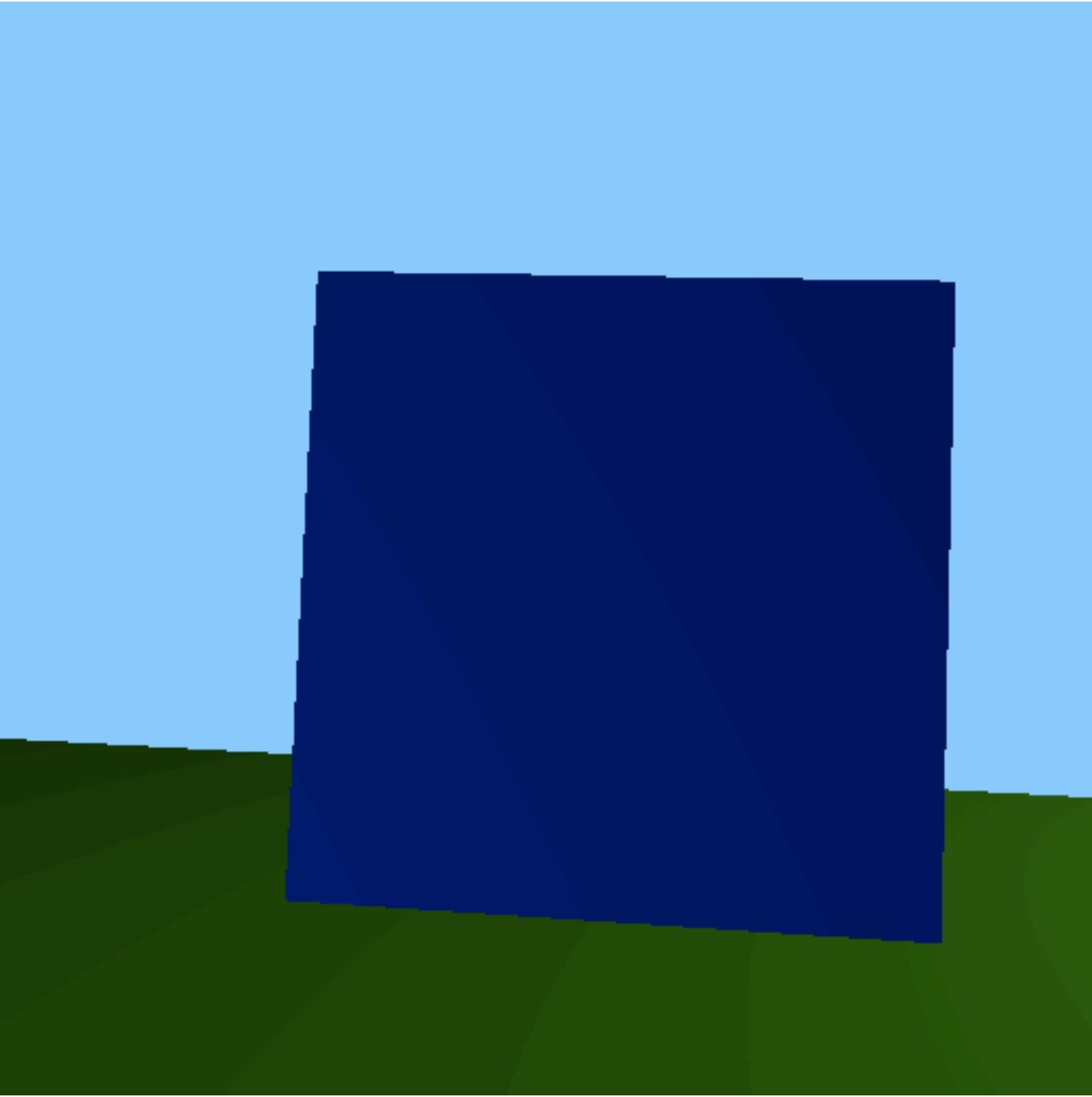


d



3D Scenes





Clipping

Culling

Video

Codecs

Video Codecs

Video Codecs

- H.264
- Theora
- VP8

Containers

Video Containers

Video Containers

- AVI
- MKV
- MP4
- MOV
- Ogg
- WebM

Compression



<http://youtu.be/dIJA-nh0IfI>

Streaming

Buffering

Resolution

Aspect Ratio

Adaptive Bitrate Streaming

GPUs



<http://youtu.be/-P28LKWVTzrl>

<http://youtu.be/mVUf-HlQjd8>

Flash

Problem Set 5

[http://www.cafepress.com/make/
personalized-gifts](http://www.cafepress.com/make/personalized-gifts)

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