Sound / Music

Local Maxima
Davenport University
July 14, 2020
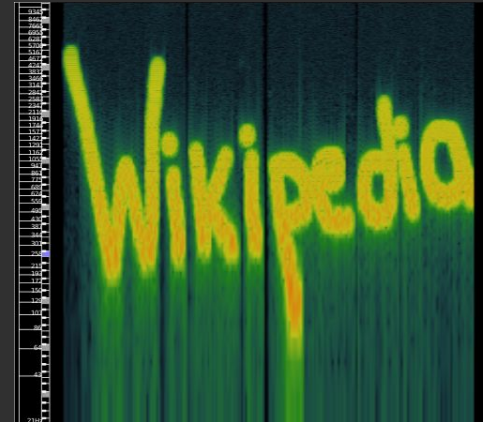
Sound

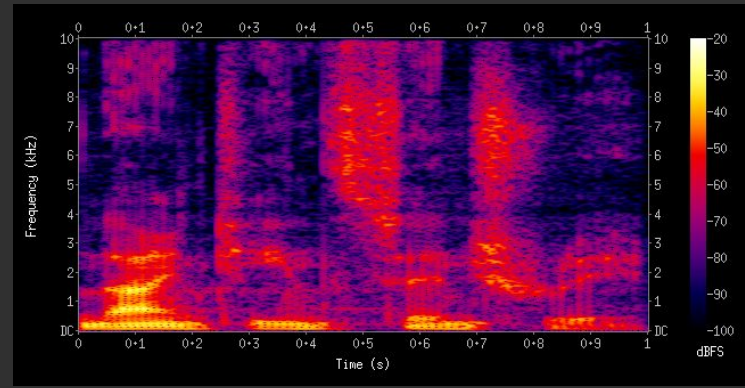# Steganography

Alternate audio link
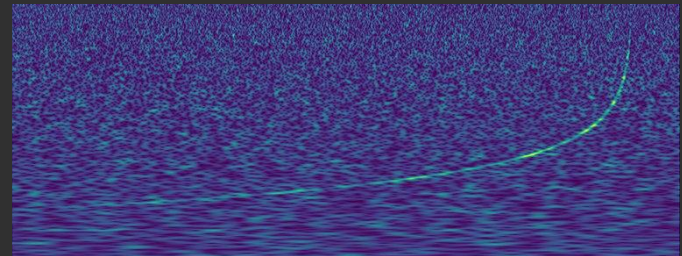
Spectrograms

https://en.wikipedia.org/wiki/Spectrogram
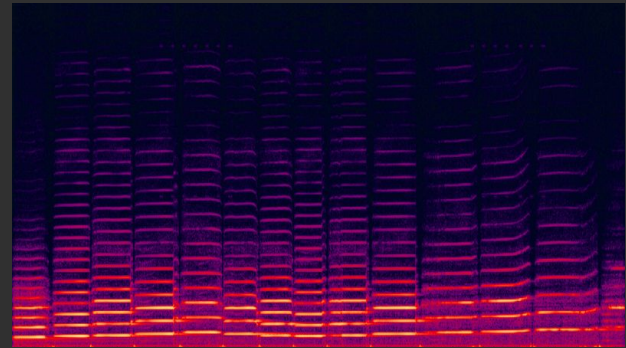
Speech

https://sail.usc.edu/~lgoldste/General_Phonetics/Consonants/Ca.html

http://hyperphysics.phy-astr.gsu.edu/hbase/Music/vowel.html

https://en.wikipedia.org/wiki/Vocal_cords

Infants and crying / speech

Close Encounters - https://youtu.be/m2JL0xABlrQ
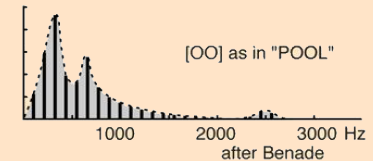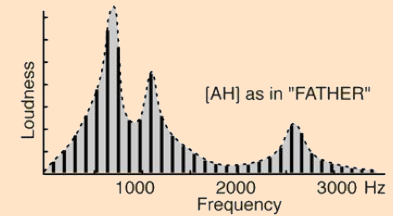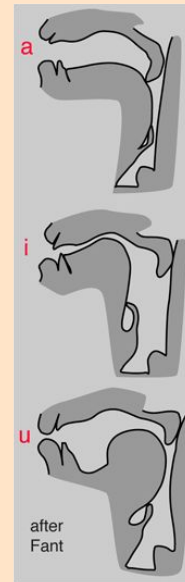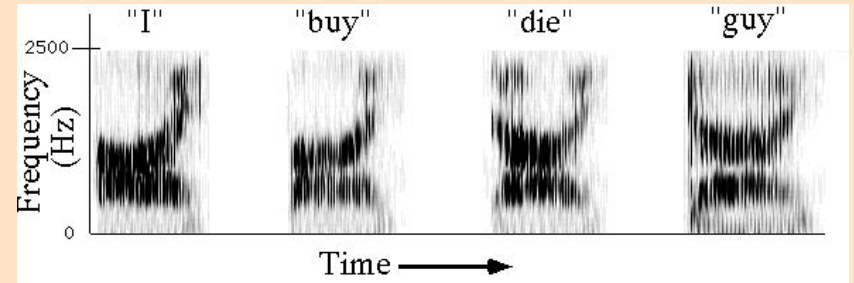
Resonance

https://en.m.wikipedia.org/wiki/Natural_frequency

https://en.m.wikipedia.org/wiki/Resonance
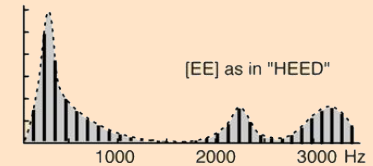
https://en.m.wikipedia.org/wiki/Acoustic_resonance

https://www.forbes.com/sites/startswithabang/2017/05/24/science-busts-the-biggest-myth-ever-about-why-bridges-collapse

https://en.wikipedia.org/wiki/Tidal_resonance

Wine glass breaking

Analysis

https://oeis.org/play.html

http://musicalgorithms.org/4.1/app/#/home

http://news.mit.edu/2014/algorithm-recovers-speech-from-vibrations-0804
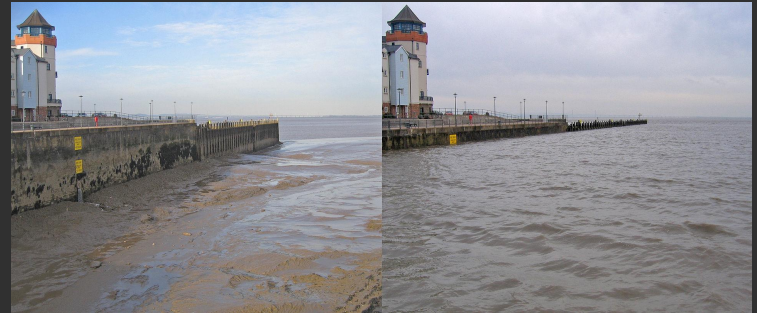
https://en.wikipedia.org/wiki/Fast_Fourier_transform

https://www.eit.lth.se/fileadmin/eit/courses/etin80/2018/reports/beat-detector.pdf

Fourier Series video (on right): https://www.youtube.com/watch?v=ds0cmAV-Yek

Waves

White noise (sleep, privacy)

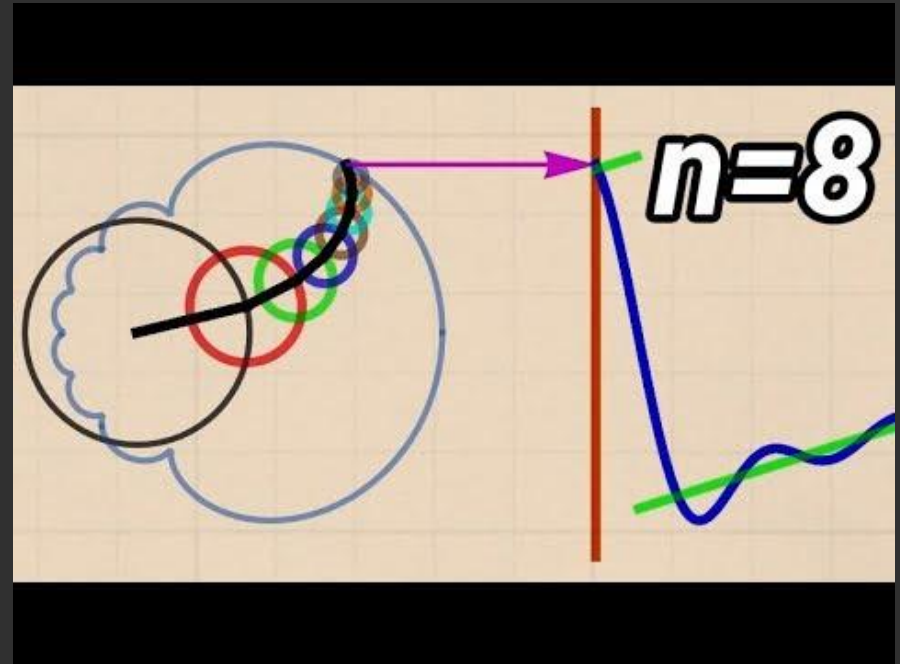https://en.m.wikipedia.org/wiki/Noise-cancelling_headphones

Interference video (on right): https://www.youtube.com/watch?v=b87QZtYKmqo

Music

What is music?

Genres, etc.

https://en.m.wikipedia.org/wiki/Electronic_music

https://en.wikipedia.org/wiki/Tempo

How many can genres of music you name?

How many subgenres of electronic music can you name?

Music and Memory

ABCs, 123s?

Absolute Pitch

Amusia (tone deafness)

Hooks

Think of any jingles?

Jingles video (on right):

Other Items of Interest

https://en.wikipedia.org/wiki/Shepard_tone

https://en.m.wikipedia.org/wiki/Consonance_and_dissonance

https://en.m.wikipedia.org/wiki/Sonic_boom

https://en.m.wikipedia.org/wiki/Sound_barrier

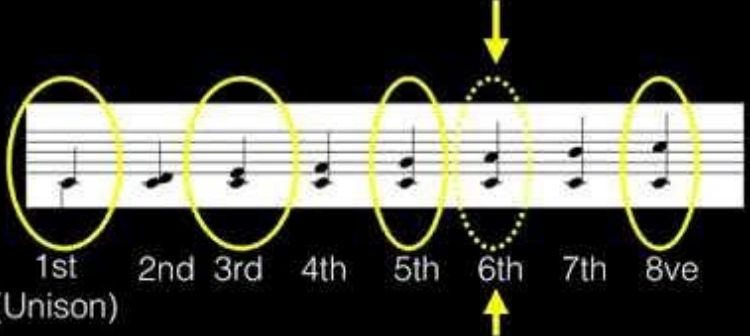Sitcom without laugh tracks https://youtu.be/jKS3MGriZcs

https://www.wbur.org/hereandnow/2018/04/17/classical-musicians-hearing-loss

What does music add to movies, games, etc?

Scoring

Consonance and Dissonance video (on right):
https://www.youtube.com/watch?v=sGTRB9w8c8g

More items discussed during July 14, 2020 meeting

http://web.sbu.edu/theology/bychkov/escher_stairs.html

Can you hear the shape of a drum?
https://www.youtube.com/watch?v=SIOLRcU7FZo

Donald Duck - Mathmagic Land
https://www.youtube.com/watch?v=U_ZHsk0-eF0

Chaotic Pendulum
https://www.youtube.com/watch?v=mZ1hF_-cubA
https://www.youtube.com/watch?v=_fMwF0khpTY

Tacoma Narrows Bridge Collapse (1940)
https://en.wikipedia.org/wiki/Tacoma_Narrows_Bridge_(1940)
https://www.youtube.com/watch?v=j-zczJXSxnw

How to pronounce Euler - "Oiler"
The natural frequency of a bathroom stall
Jared's child cries sometimes, and more…!

Communication with the stars
https://voyager.jpl.nasa.gov/golden-record/
https://en.wikipedia.org/wiki/Pioneer_plaque

Somewhere over the rainbow
https://www.youtube.com/watch?v=V1bFr2SWP1I

THE AHHHH Song
https://www.youtube.com/watch?v=EzTaHbjWgZM

Holst - The Planets (inc flash mob)
https://www.youtube.com/watch?v=q3cpOrB1GW8
https://en.wikipedia.org/wiki/The_Planets

Gravitational Wave GW170817
https://www.youtube.com/watch?v=aWX-BY-A9CY

RingZer0 Online CTF (steganography, etc)
https://ringzer0ctf.com/challenges

Let's make a game!

Idea we discussed for our Unity game development day next month (August):

Play music with certain BPM (beats per minute) to eliminate blocks with the matching "natural frequency" - dubbed "angry birds, but with music"

Any to Share?

Thanks for Attending!