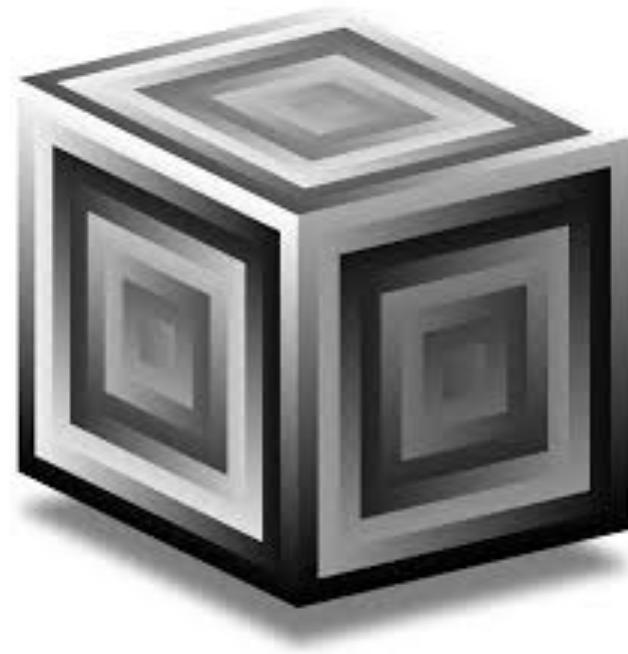


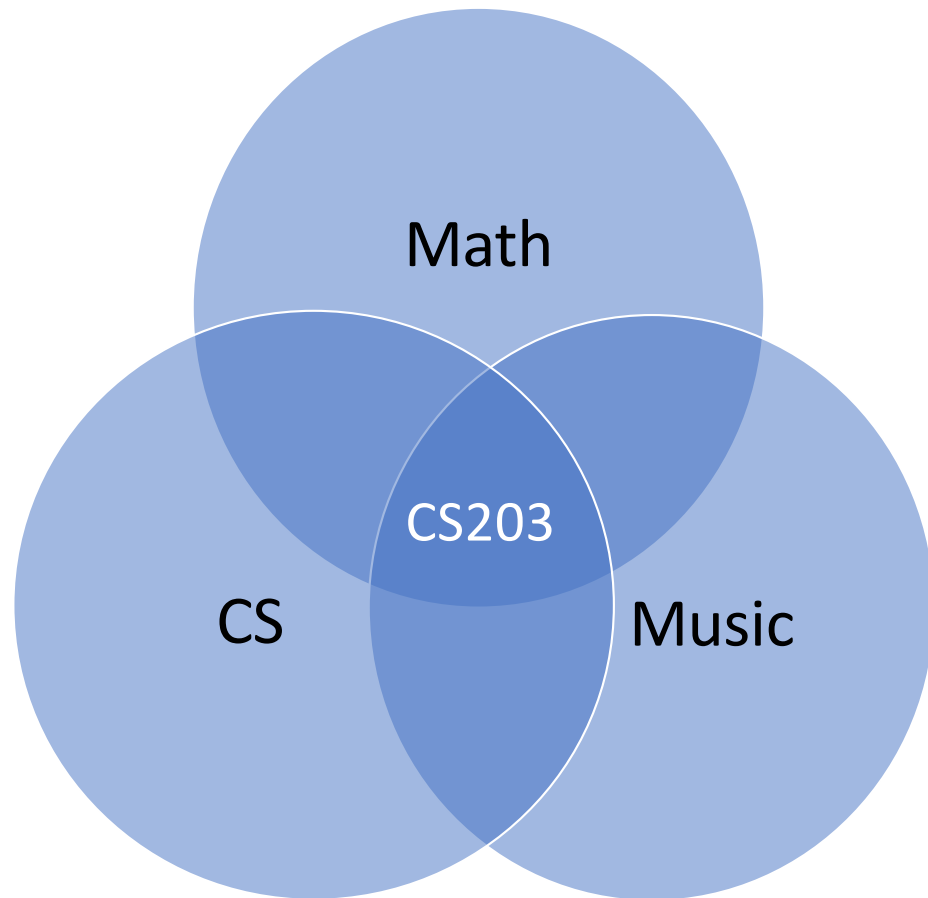
CS203: Wrapping Up

Topics Addressed

- The Big Picture
- Beyond CS203
- Opportunities



Computer Music



Why Talk About Music?

- Any discipline, including artistic disciplines, invites rigorous discussion, analysis, and formalization. Invariably such discussions involve topics from other disciplines.
- Music has **always** involved the use of technology and mathematics.
 - 6th Century BCE: Pythagoras invents the use of a tuning system involving the ratio of numbers. All intervals derived from the ratio of a perfect fifth (3:2)
 - 1450: The invention of the printing press by Johann Gutenberg revolutionizes the distribution of music.
 - 1846: Adolphe Sax invents the saxophone. With the exception of the voice, all music is created through technological inventions.
 - Even choral music is greatly influenced by the hall or space in which the music is sung.

Why Talk About Computer Science?

- Computation has revolutionized the speed and the automation of tasks involve computation.
 - You saw a small example of that calculating the DFT using a program vs. by hand.
- Important benefits of computers to music
 - Storage (Analog equivalents – records/phonographs)
 - Streaming
 - Networking
 - Synthesis
 - Processing – algorithms that describe manipulations of audio samples
- Computers give us the tools to do/perform musical tasks that would be otherwise impossible.

Why Talk About Mathematics?

- Mathematics gives us the techniques to describe and reason about sound
- Allows us to formalize and build algorithms to manipulate sound
 - Think: filters, DFT, compression,
- Can make objective analyses of music and sound
 - Less of it sounds “pretty” and more about the actual substance

Beyond CS203

- Take MUS 275 at Wellesley: Electronic and Computer Music
 - Take the skills you have learned here and apply them to higher level software to create music. Offered in Spring 2022!
- Like the more technical side of things? Take MIT's 6.003 (Signals and Systems)
- MIT Media Lab
- Graduate School
- Job Opportunities

Graduate School

- Stanford's CCRMA - <https://ccrma.stanford.edu/academics/masters>
- UC Berkeley's CNMAT - <https://www.cnmat.berkeley.edu/>
- McGill - <https://www.mcgill.ca/music/programs/ma-music-technology>
- Georgia Tech - <https://music.gatech.edu/master-science-music-technology>
- NYU - <https://steinhardt.nyu.edu/degree/mm-music-technology>

Job Opportunities

- Izotope
- MOTU
- Spotify
- Bose
- Audible
- Sonos
- Apple
- Amazon