

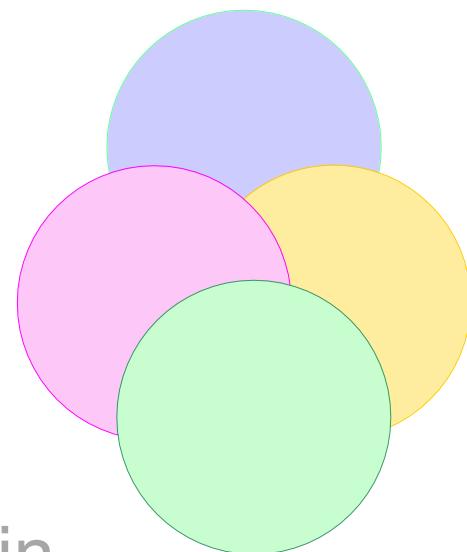
From Analogue to Digital: Sound Input through the Ages

Music 253/CS 275A
Stanford University



Classifying Data Domains

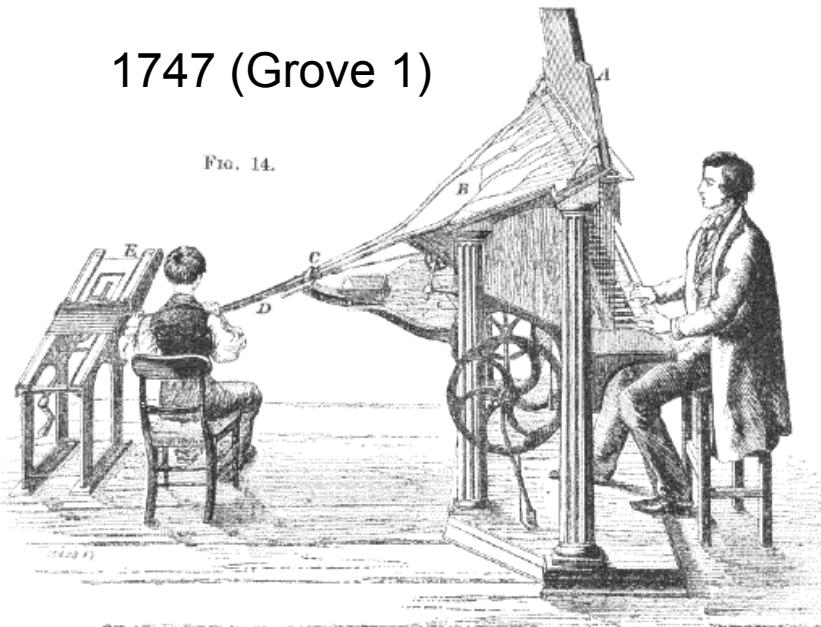
- Visual domain
 - scores, parts
- Sound/Aural domain
 - performance, recordings
- Logical domain
 - analytical data sets
- Cognitive/perceptual domain
 - how we hear/understand music



Automatic transcription

1747 (Grove 1)

FIG. 14.

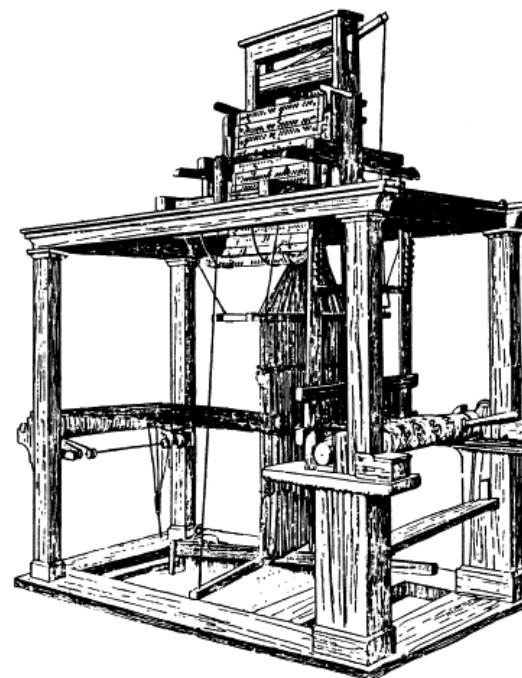


FIGS. 12 TO 14. YOUNG'S COMPOSING MACHINE

19th century

Horizontal loom

Vertical (Jacquard) loom, 1855



Sound generators

<https://music.stanford.edu/projects/player-piano-project>

Machines to generate sound in order

- to **generate** music [compose or arrange on the fly]
- to **perform** music already composed or arranged
- to **transcribe** music from performance



Organ roll



http://www.youtube.com/watch?v=oQji_l6gSH0

Sound generation and capture

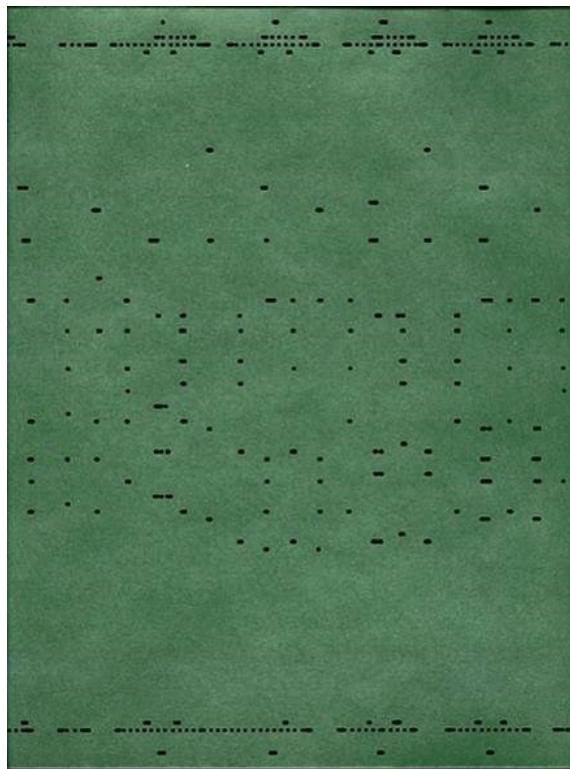
□ c.1800 AD



Franklin's Glass Harmonica

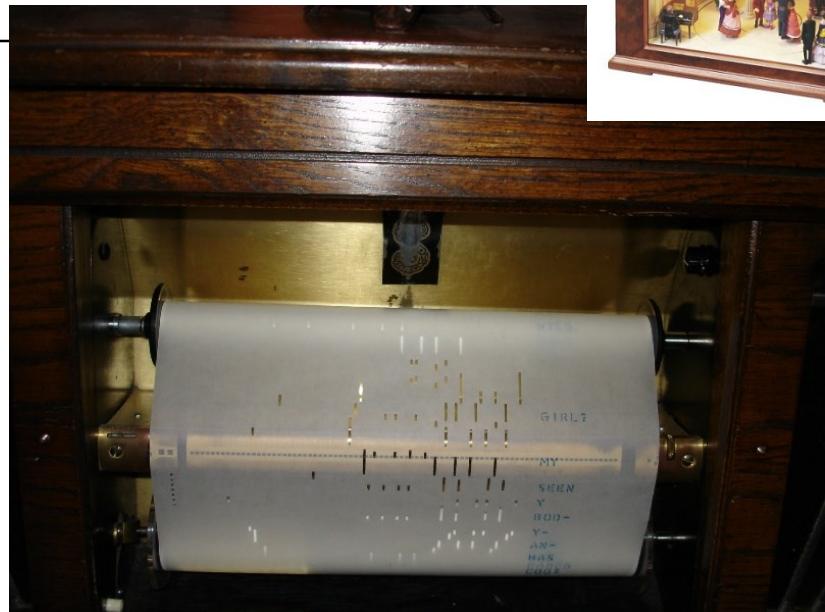
<http://www.youtube.com/watch?v=-WZExmtIJkI>

□ c.1905



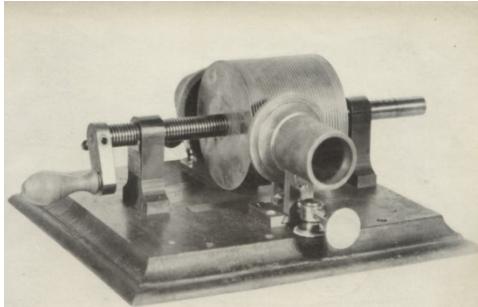
Welty-Mignon piano roll

Music Boxes and Piano Rolls

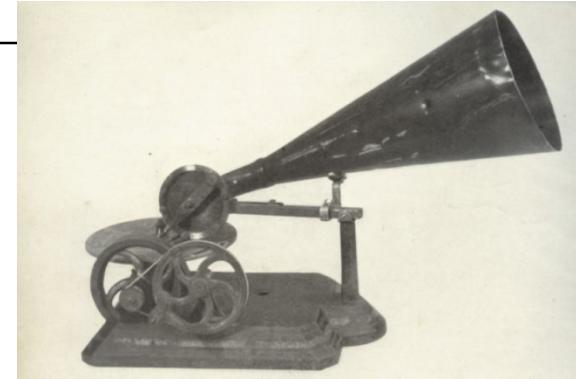


<http://www.pianola.co.nz/index.asp>

Reproducing music: Early recording technology

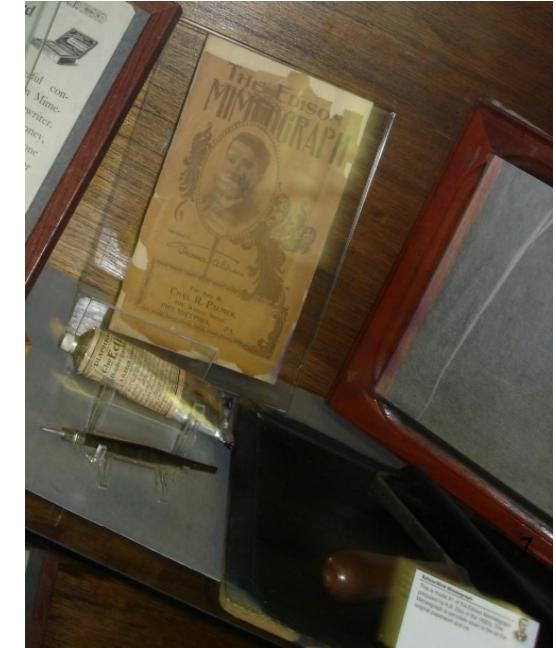


Edison Amberol c. 1908



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2016 Eleanor Selfridge-Field



Reproducing music: Early phonography

Edison home phonograph c. 1914



Edison floor model 1921



Interfacing hardware to software

Let machines deal with machines
(robotics):



Self-playing tuba

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Give users independent control of
different parts of machine:



Wurlitzer band organ

2016 Eleanor Selfridge-Field

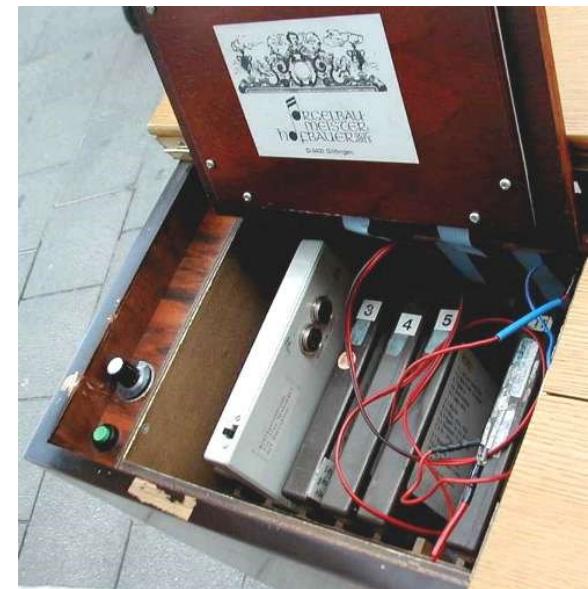
Basic properties of MIDI

- Eight-bit architecture
- Files are binary
- Highly standardized

Street-organ controller



Harmonipan



Theater organs

- Trautonium (Sala, 1940-60s; Hitchcock films)

<https://www.youtube.com/watch?v=-tQQEChMq1A>

- Orchestrion:

https://www.youtube.com/watch?v=955mEk_q8hM

- Wurlitzer theater organ:

<https://www.youtube.com/watch?v=p0ITdcZiFus>