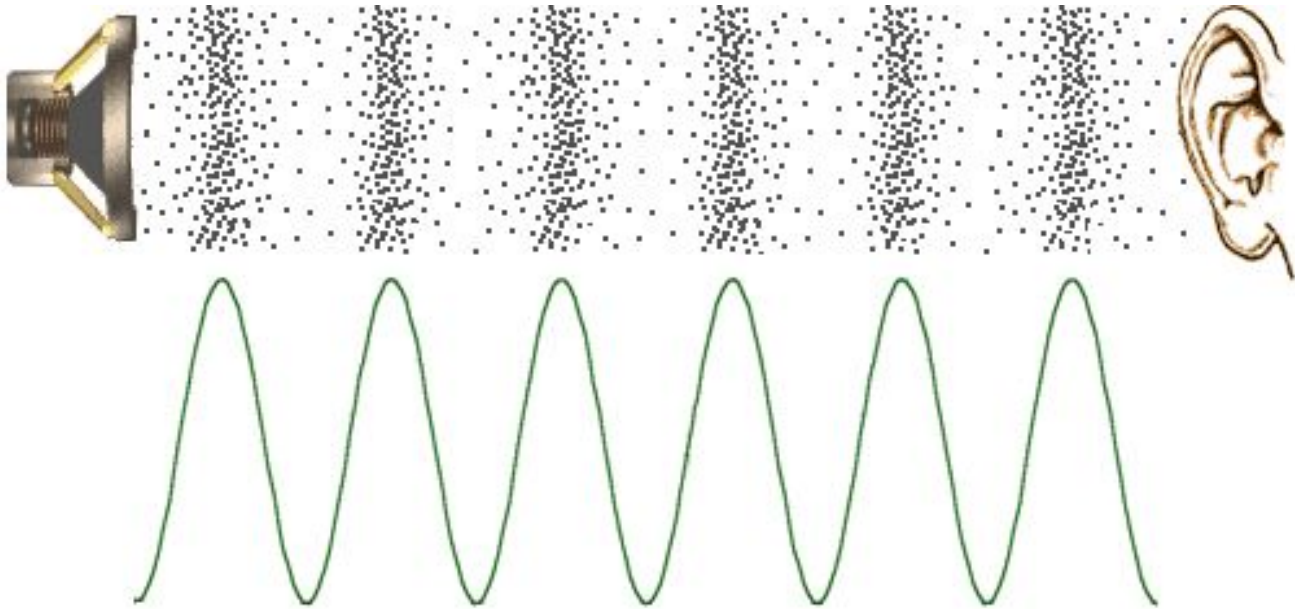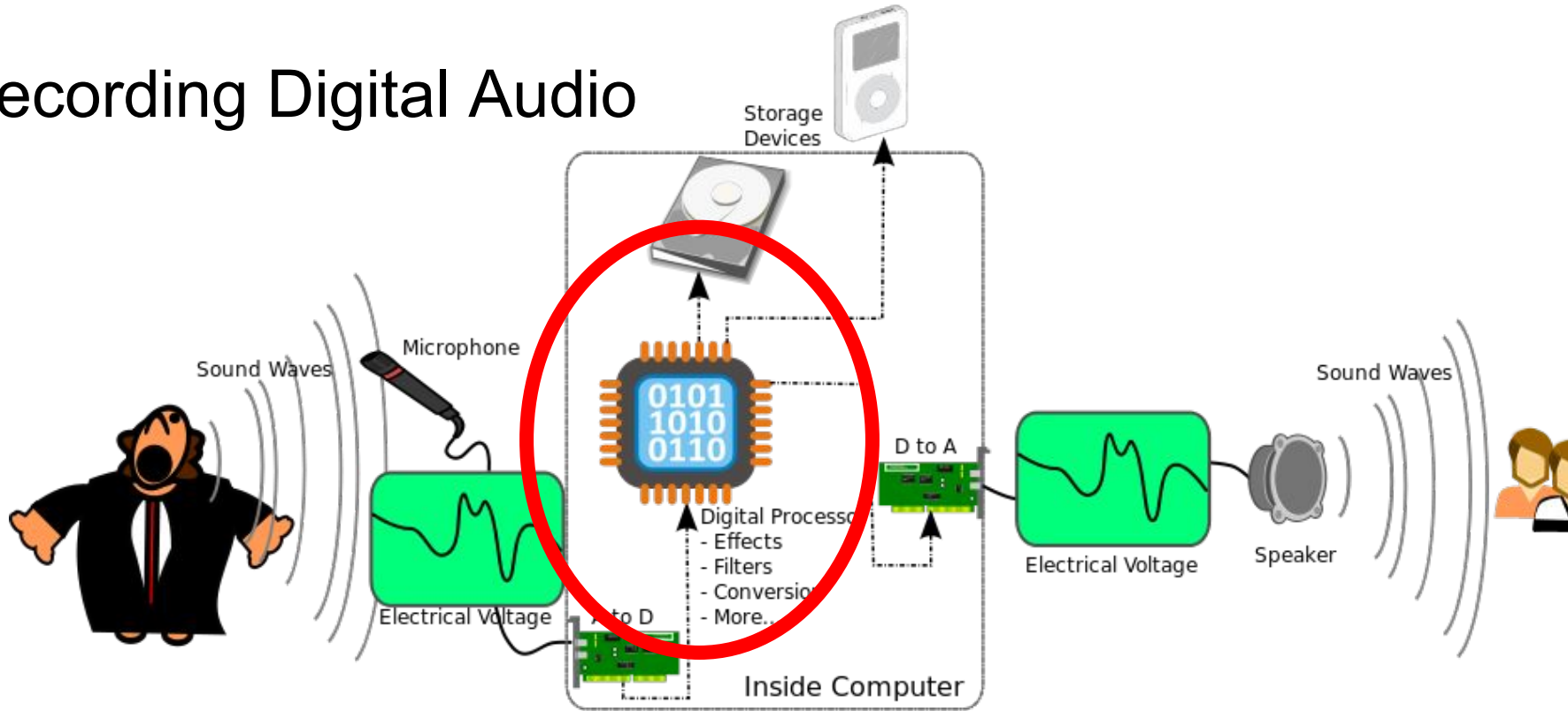# Digital Audio & MIR 101

Music Information Retrieval Algorithms for Oral History Collections

Sound

Sound is air (or molecules in another medium) vibrating. The green audio signal represents the fluctuation in air pressure caused by the vibration as a function of time

Recording Digital Audio

Fluctuations in air pressure can be measured with a microphone, converted to changes in electrical voltage, and then stored (recorded) as a digital signal

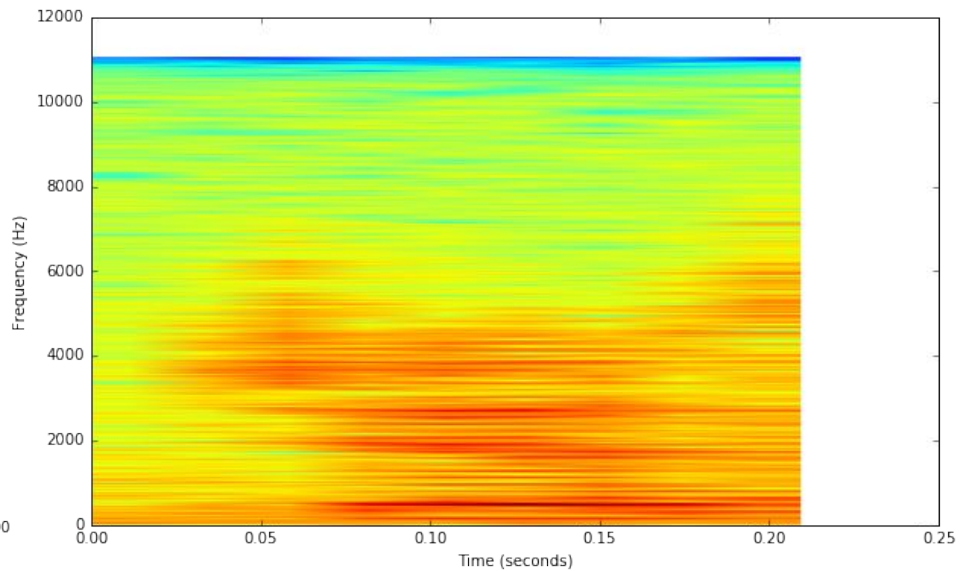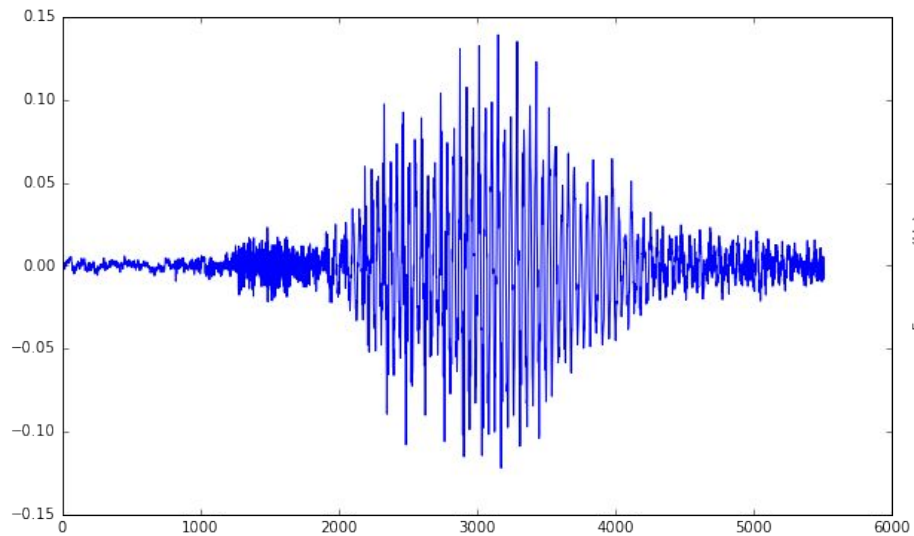# Digital audio (representing sound in numbers)
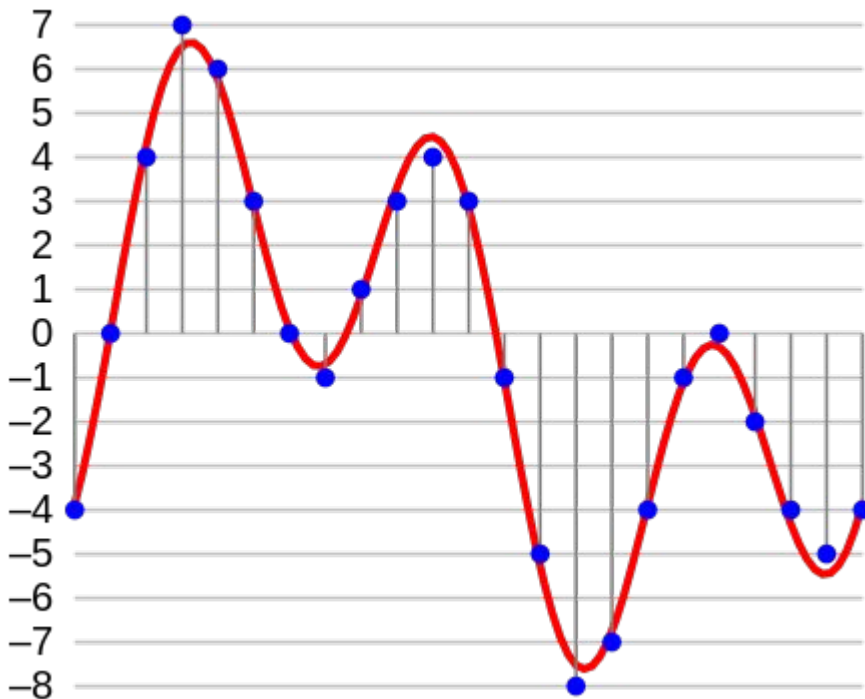
The analogue electrical signal is sampled X times per second = *sampling rate* (SR)

Amplitude is represented by a number (range determined by *bit depth*)

We will deal with these lists of numbers (these are then encoded as 0s and 1s)
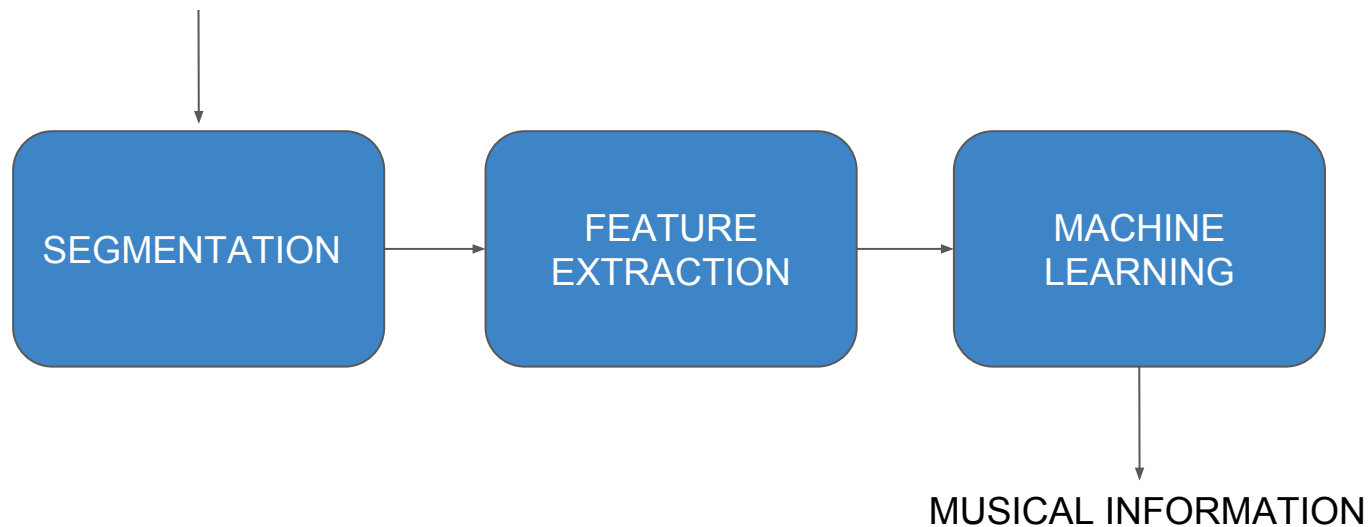
= [-4, 0, 4, 7, 6, 3, 0, -1, 1, ...]
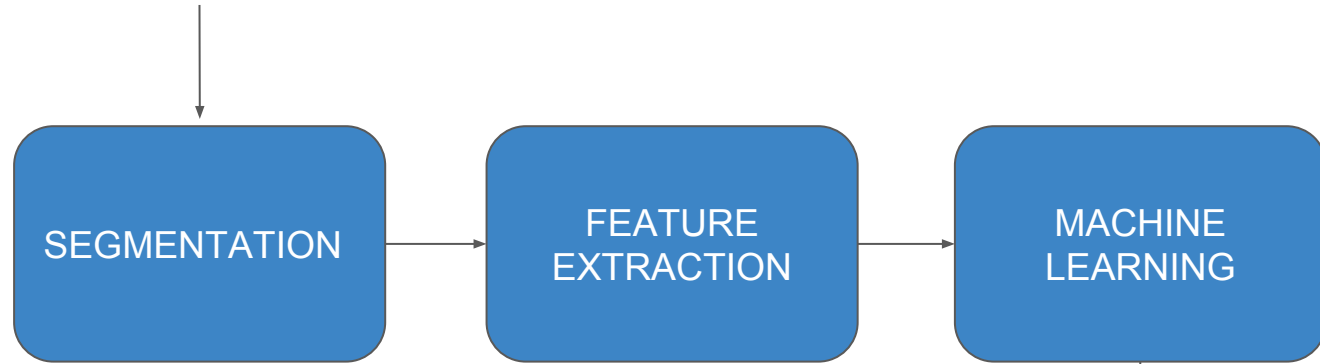
Time vs Frequency Domain

MIR workflow

DIGITAL MUSIC RECORDINGS

```
SEGMENTATION  →  FEATURE
                 EXTRACTION  →  MACHINE
                                LEARNING
```

MUSICAL INFORMATION

OHIR workflow

Audio Features - low level

Audio Features - Hi level

Machine Learning

Clustering

Applications in Oral history?

Plan for the rest of the session

References