

# Pitch Detection

## A Primer

- Studied since 19th<sup>C</sup>
- Active research area - new papers published every year, but mono is basically solved
- Two main schools - waveform (time) and spectrum (place)
- Objective: determine the period of repetition in a cyclical waveform
- Pitfalls: octave errors, missing fundamental, band-limited spectra, AM carrier vs. AM modulator, effect of reverbs etc.

Auto-correlation

Specifically, at time, i, given a sequence of sampled data, {x<sub>j</sub>}, of a waveform of period L for j=0, . . . , i, the auto-correlation as a function of lag n can be expressed,

$$\Phi_{i,L}(n) = \sum_{j=i-L-1}^i x_j x_{j-n}$$

(1)

