



PITCH PERCEPTION

What gives a sound “pitch”

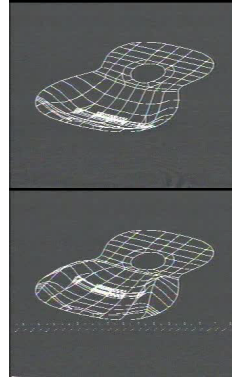


More on “Real” Sounds

- Objects have modes of vibration
- Modes of vibration have characteristic frequencies
- In some cases, characteristics are approximately harmonic
- E.g. stretched strings
- Modes generally decay exponentially
- Non-linear coupling between modes can complicate things

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Dr. B. Richardson, Cardiff University

“Driven” Oscillators

- Something interesting happens when musical instruments are driven into oscillation
- The feedback mechanism that sustains oscillation results in periodic oscillation
- (Perfect) periodicity implies exactly harmonic partials
- Noise, jitter, non-uniform driving forces, etc., complicate the picture



A sarinda is a musical instrument from Afghanistan.

Pitch Perception

- Strongly related to frequency
- Sense of pitch enhanced by harmonics
- Pitch perception is approximately logarithmic
- Musical octave: 2 x frequency
- Divide octave into 12 log-spaced semitones (half-steps)
- Divide semitones into 100 log-spaced cents
- We are sensitive to about 5 cents



100 cents =
1 semitone=
1 half-step

1 octave = double
(fundamental)
frequency

