

MUS421–571.1
Electroacoustic Music Composition

Kirsten Volness – 6 March 2018

Max Mathews



Computer Music

- Bell Labs
 - Max Mathews
 - Music–N (beginning 1957)
 - Programs made on punch cards
 - *Bicycle Built for Two* (1961)
- Stanford (CCRMA)
 - John Chowning
 - FM Synthesis (1971) — Synclavier
- IRCAM (1970)
 - Pierre Boulez, Jean-Claude Risset

FFT / Sound Spectra

- FFT = Fast Fourier Transform
 - Algorithm, process by which one can analyze the spectral data in sound
- Jonathan Harvey's *Mortuos Plango, Vivos Voco* (1980)



Human and Superhuman Sounds

- Paul Lansky – *Idle Chatter, notjustmoreidlechatter*
- Trevor Wishart – *Tongues of Fire, Red Bird*

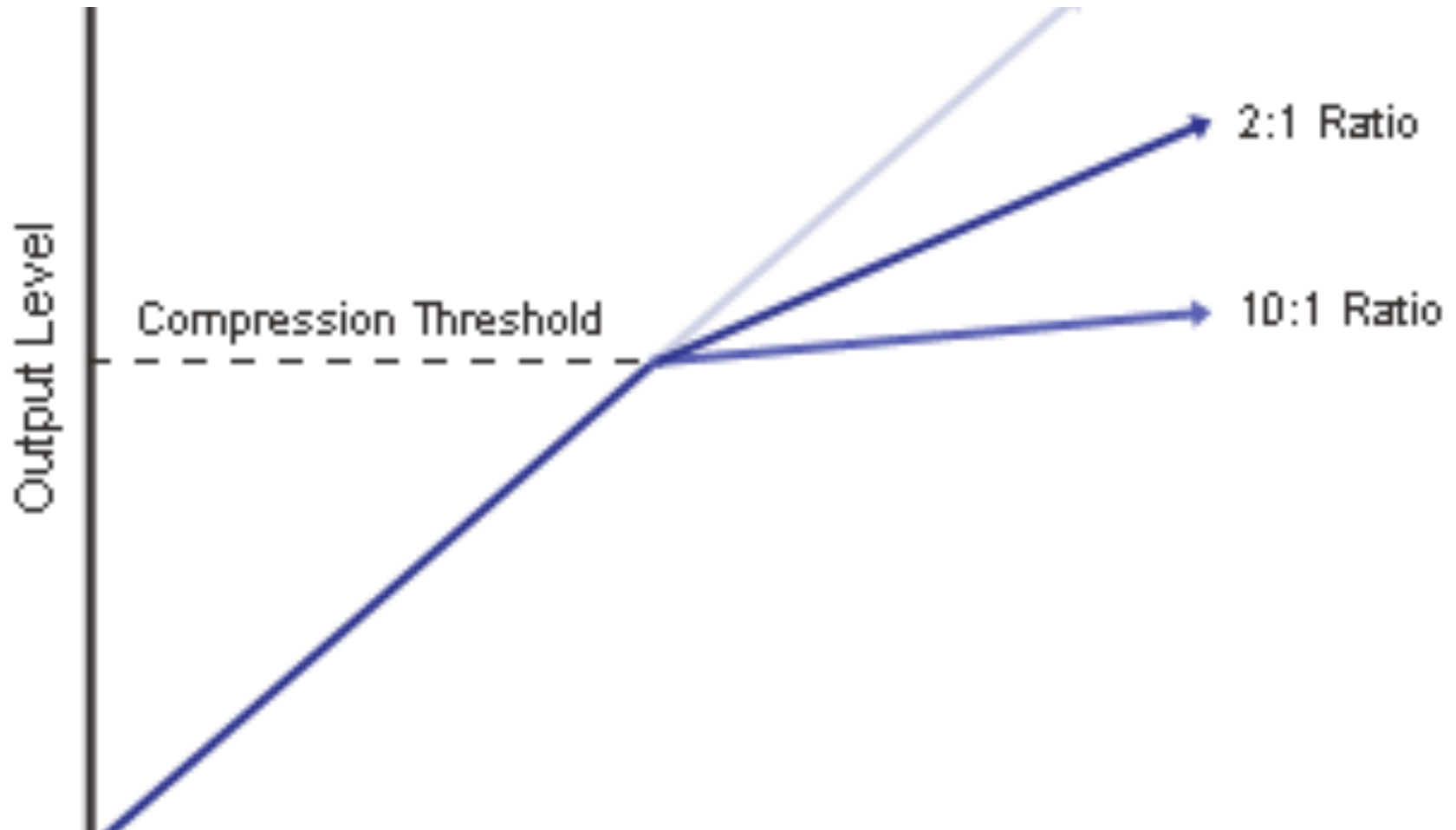
Summary

- Computer music allowed for new modes of composition
- Analytical / algorithmic approach
- Interest in human connection to sounds
- Increased possibility for performativity as technology develops towards invention of synthesizers

Compression

- Threshold – dB level at which compression takes effect (anything louder than -24dB is affected)
- Ratio – amount of compression applied (2:1 = anything louder than -24dB will be $\frac{1}{2}$ as loud)
- Knee – how abruptly the effect is applied
- Expansion – opposite effect (anything louder than -24dB is made 2x as loud)
- Multi-band compressor – changes level of compression based on various frequency ranges

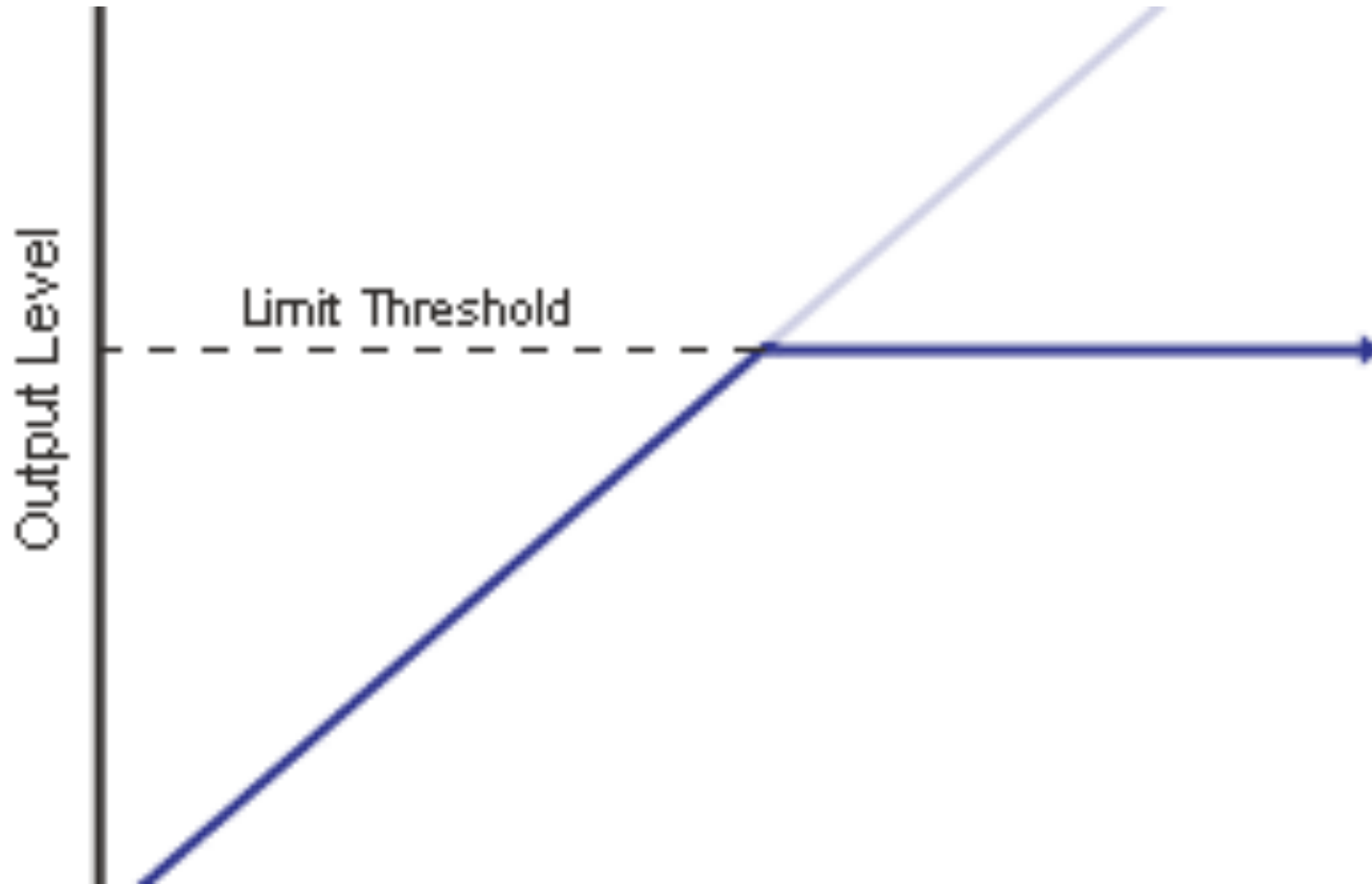
Compression



Limiting

- Creates hard cut off at set threshold (no sound will be louder than -3dB if -3dB is threshold)
- Useful for mastering final mix
- Useful for ensuring your recording will not clip

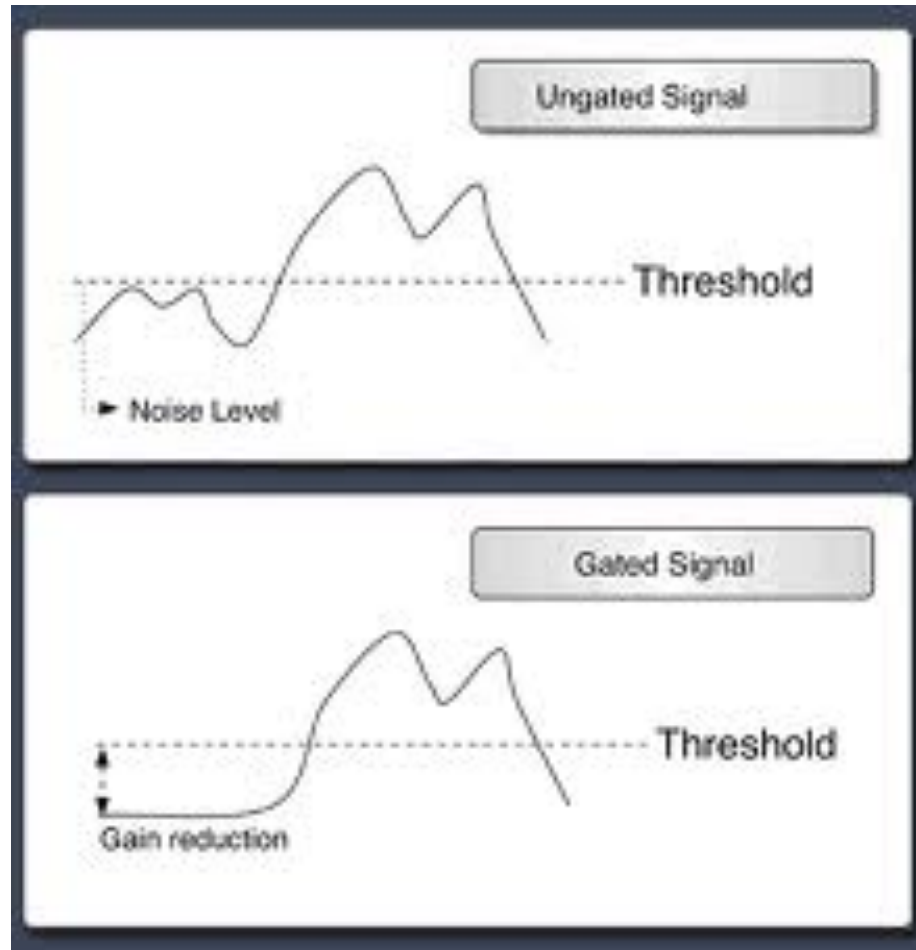
Limiting



Gating

- Allows only the sound that exceeds the threshold to be heard
 - Often used with snare drum so only loudest part of sound is heard (changes sound envelope)
- Sidechain
 - Allows the envelope of one sound to be mapped onto another

Gating



Listening Examples

- Janet Jackson – *What Have You Done For Me Lately?*
- Phil Collins – *In the Air Tonight*
- David Bowie – *Heroes* (see next)
- Daniel Worley – *Freak Show*
- Elainie Lillios – *Arturo*
- Evan Chambers – *Lament*

A note about *Heroes*

- **Multi-latch gating**
- The invention of a technique, called **multi-latch gating** by Jay Hodgson, common in classical music recordings for years, is often credited to producer Tony Visconti, whose use on David Bowie's "Heroes" may have been the first in rock. Visconti recorded Bowie's vocals in a large space using three microphones placed 9 inches (23 cm), 20 feet (6.1 m), and 50 feet (15.2 m) away, respectively. A different gate was applied to each microphone so that the farther microphone was triggered only when Bowie reached the appropriate volume, and each microphone was muted as the next one was triggered. "Bowie's performance thus grows in intensity precisely as ever more ambience infuses his delivery until, by the final verse, he has to shout just to be heard....The more Bowie shouts to be heard, in fact, the further back in the mix Visconti's multi-latch system pushes his vocal tracks [dry audio being perceived as front and ambience pushing audio back in the mix], creating a stark metaphor for the situation of Bowie's doomed lovers shouting their love for one another over the Berlin wall."