

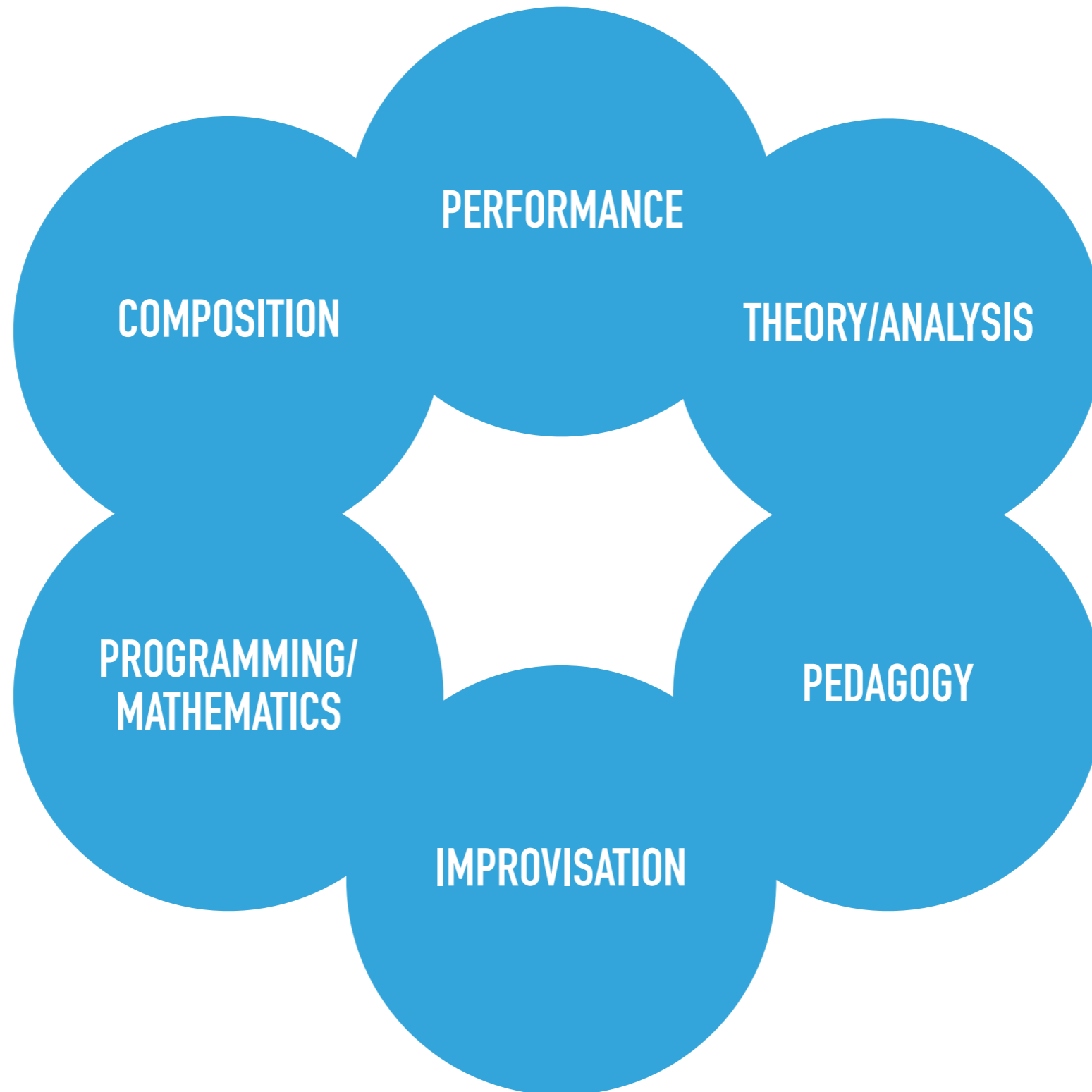
MILTON MERMIKIDES (SURREY)

CARL FAIA (BRUNEL)

THE EXTENDED GUITAR:

INTEGRATION OF THE GUITAR WITH MAX/MSP FOR
RHYTHMIC ANALYSIS AND PEDAGOGY

MERGED BACKGROUNDS



PEDAGOGY AS PRACTICE

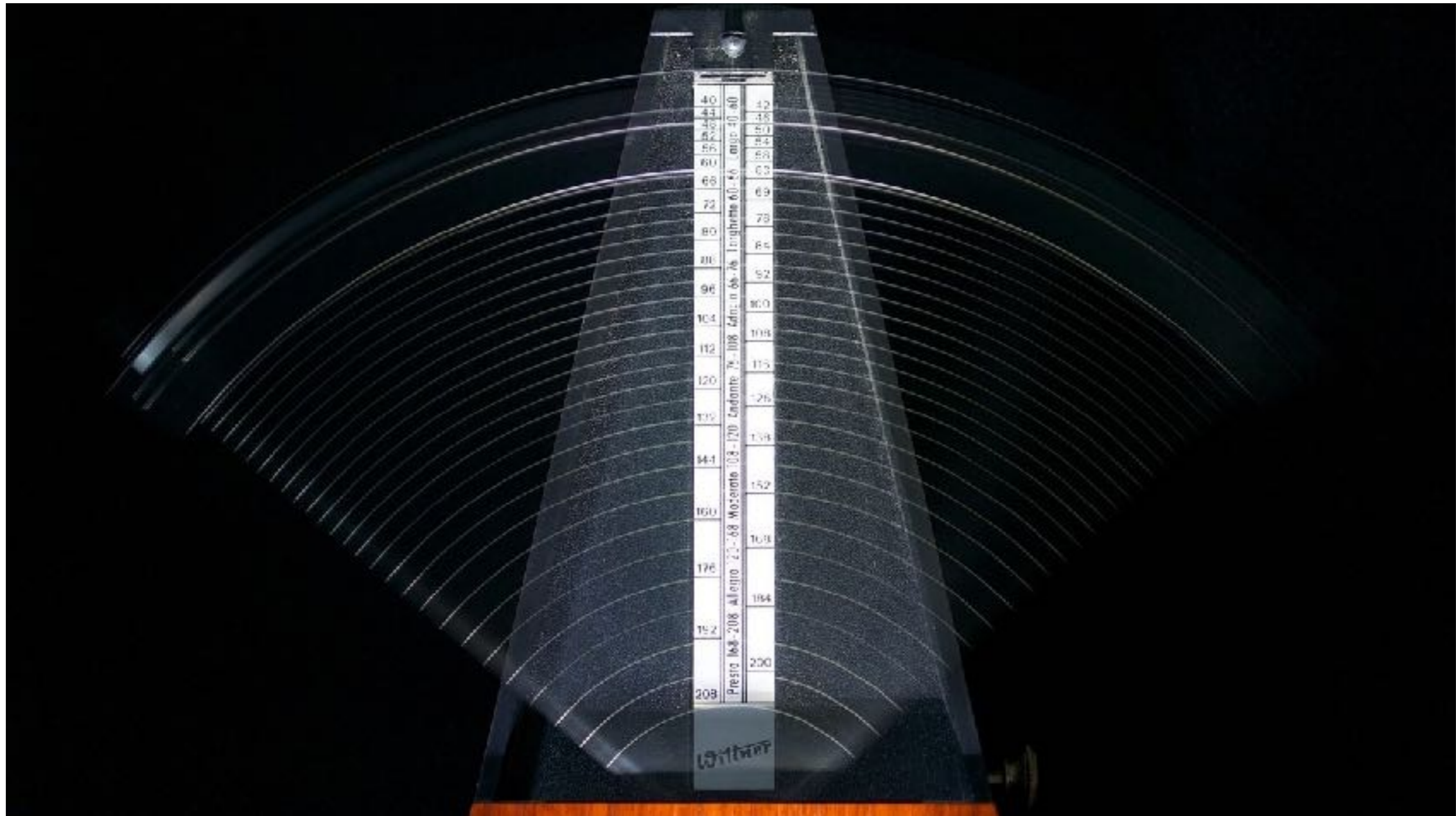
The screenshot displays the A7_DH_The_Patch (presentation) software interface, which is a complex digital audio workstation (DAW) for extended guitar processing. The interface is divided into several main sections:

- Signal Flow Graph (Top Left):** A grid-based diagram showing the signal path through various modules. The path starts with ADC (Analog-to-Digital Conversion) and goes through Delay, Trans (Transposition), Filters, Site (Spatialization), Gran (Granular), and Rev (Reverb) modules. The path is color-coded and includes a 'clear' button.
- Reverb (Top Right):** A module labeled '1 reverb' with parameters for room size (75.00), reverb time (59.19), dry (0.50), early (0.25), tail (0.75), damping (0.70), width (0.50), freeze, and volume (-30.74).
- Forbidden Planet (Middle Right):** A module labeled 'Forbidden Planet X' with a live view and parameters for volume (0.00) and speed (0.00).
- rMod (Middle Right):** A module labeled 'rMod' with parameters for volume (0.00), nodes (4), interaction, and preset (2).
- Freeze (Middle Right):** A module labeled 'Freeze' with parameters for volume (0.00), slide up (0.00), and slide down (5.00).
- Buff (Bottom Middle):** A module labeled 'Buff' with parameters for volume (0.00), record, play, loop, and start/end times (0, 2000.00, 4000.00).
- Dual Transpose (Bottom Middle):** A module labeled 'Dual Transpose' with parameters for volume (0.00), Fohit1 (0.00), Fohit2 (0.00), and Dry/Wet (100%).
- Multi-Delay (Bottom Left):** A module labeled '1 Multi-Delay' with parameters for volume (0.00) and delay times.
- ODrive2 (Bottom Left):** A module labeled '1 ODrive2' with parameters for volume (0.00), OD (1.00), LP (0.01), and RES (0.00).
- Filter (Bottom Right):** Two modules labeled '1 Filter' and '2 Filter', both with parameters for volume (0.00), Type (highpass), Freq (20.00), and Gain (1.00).
- Granular (Bottom Left):** A module labeled 'Granular' with parameters for buffering, global, start, end, gap, and speed (100%).
- Sfp 4 Track (Bottom Middle):** A module labeled 'Sfp 4 Track' with parameters for analysis, open stereo file to record, and open 4ch file to record.
- Control Panel (Bottom):** A panel with various controls including 'p DSP', 'p MIDI_TEST', 'DH_01', 'Save presets', 'Midi Learn', and 'Midi Learn reset all'.

PROJECT AIMS

- ▶ Technology as a way to directly engage with practice/ pedagogy/theory. Informed by a wide range of disciplines (from music theory, analysis to perception)
- ▶ Useful tools for the musician (in this case the guitarist) which acknowledges the continuum of performance/ composition/improvisation/pedagogy/analysis and theory
- ▶ The technological (and conceptual) opportunity to revisit the conventional tools of the musician (in her varied roles). Notation, chord theory, tuner, compositional systems...

THE EXTENDED METRONOME



MY (OUR?) RELATIONSHIP WITH TIME

- ▶ A love/hate relationship in my (Berklee and continued) training
- ▶ PhD which explored deeply micro-timing (in analysis, theory and practice)
- ▶ Continued interest in rhythmic theory on various 'time-levels'

PERSPECTIVES ON TIME AND THE METRONOME

“You’re playing on the beat you have to play *in* the beat” (Metheny)

“If you want to be a good player practise every day at 60BPM, if you want to be great do it at 40BPM” (Tomassi)

“Play it tight but loose” (Unnamed unhelpful teacher)

“Always play a blues straight” (Unnamed unhelpful teacher)

“You’re playing too metronomically, play in time” (UUT)

“It don’t mean a thing...” (Mills)

METRONOMIC

RUSHING

EDGY

DRAGGING

PUSHING

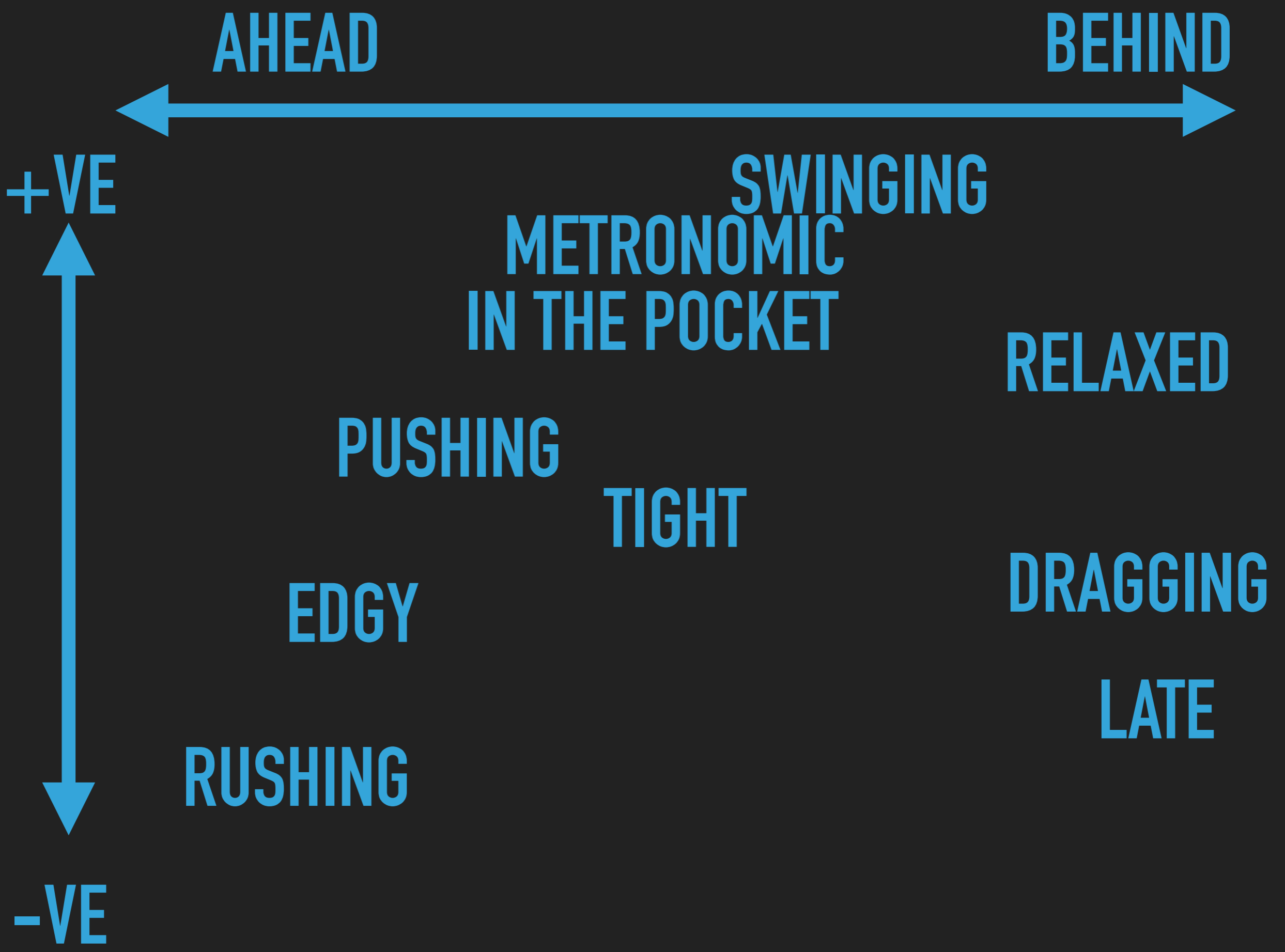
LATE

IN THE POCKET

SWINGING

TIGHT

RELAXED



PERSPECTIVES ON TIME AND THE METRONOME

Rhythmic time-feel is the most basic, fundamental element communicated by the soloist, and appreciated (or criticized) by an audience. The greatest technique, creativity, melodic accuracy, lyricism, sound, style, etc. matters very little if the music doesn't feel good rhythmically, whereas less evolved technique, ideas, melodic choices, sound etc. can actually sound okay when executed with rhythmic accuracy (good time-feel) and conviction.

Crook 1991, p 10

PERSPECTIVES ON TIME AND THE METRONOME

Good time-feel is like good barbeque sauce... I'd eat anything with a good barbeque sauce. Hell! I'd eat ____ if you gave me enough sauce!

Mahdi 1994

PERSPECTIVES ON TIME AND THE METRONOME

Even some of the most articulate jazz critics and chroniclers will avoid a penetrating discussion of swing and generally back themselves into a corner when they are asked to engage in one.

Coker 1964, p 45

SWING TEMPO

EXTENDED GUITAR - MERMIKIDES/FAIA

1



1st signal
Ready/Address



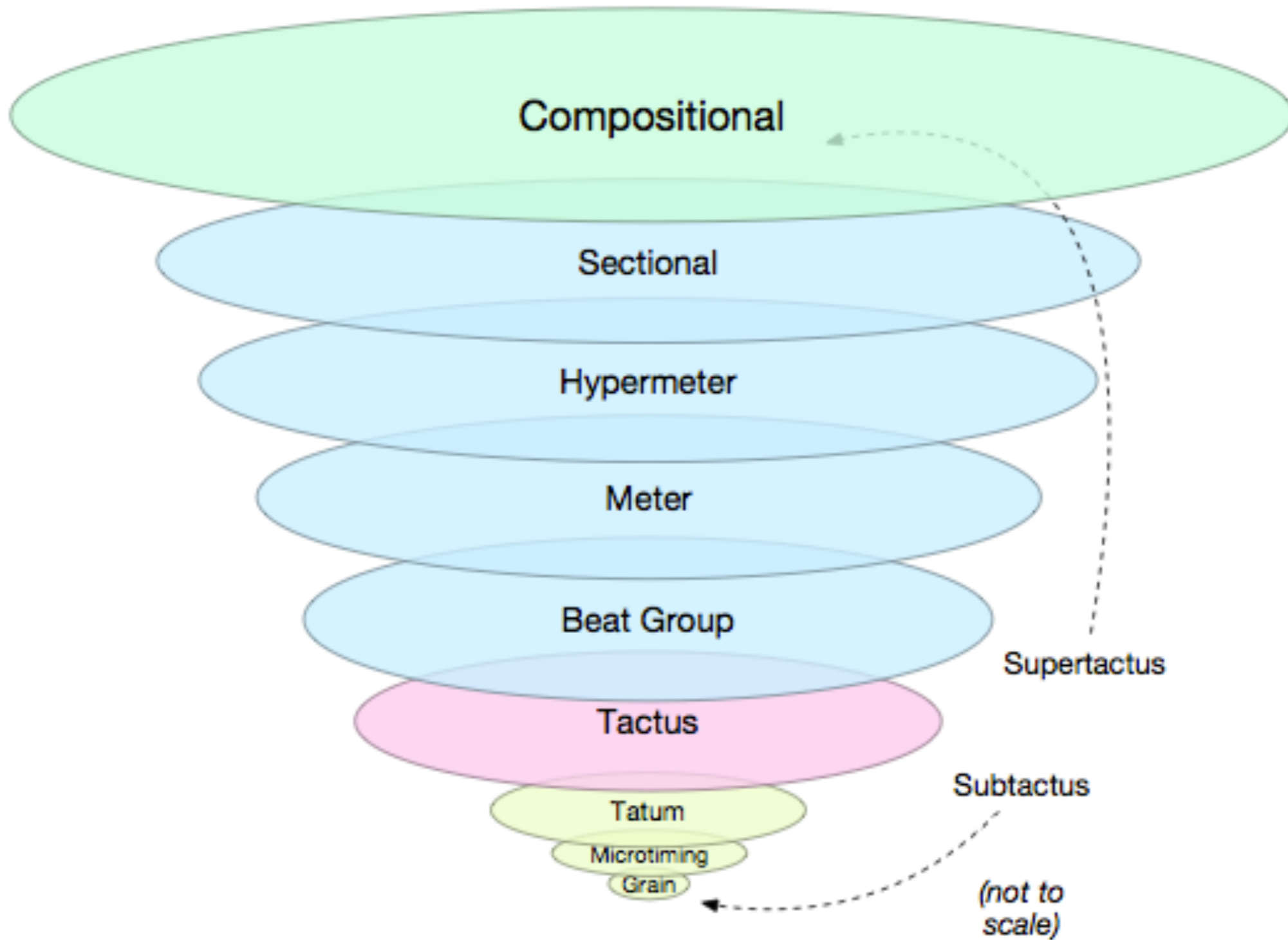
2nd signal
Backswing (BS)



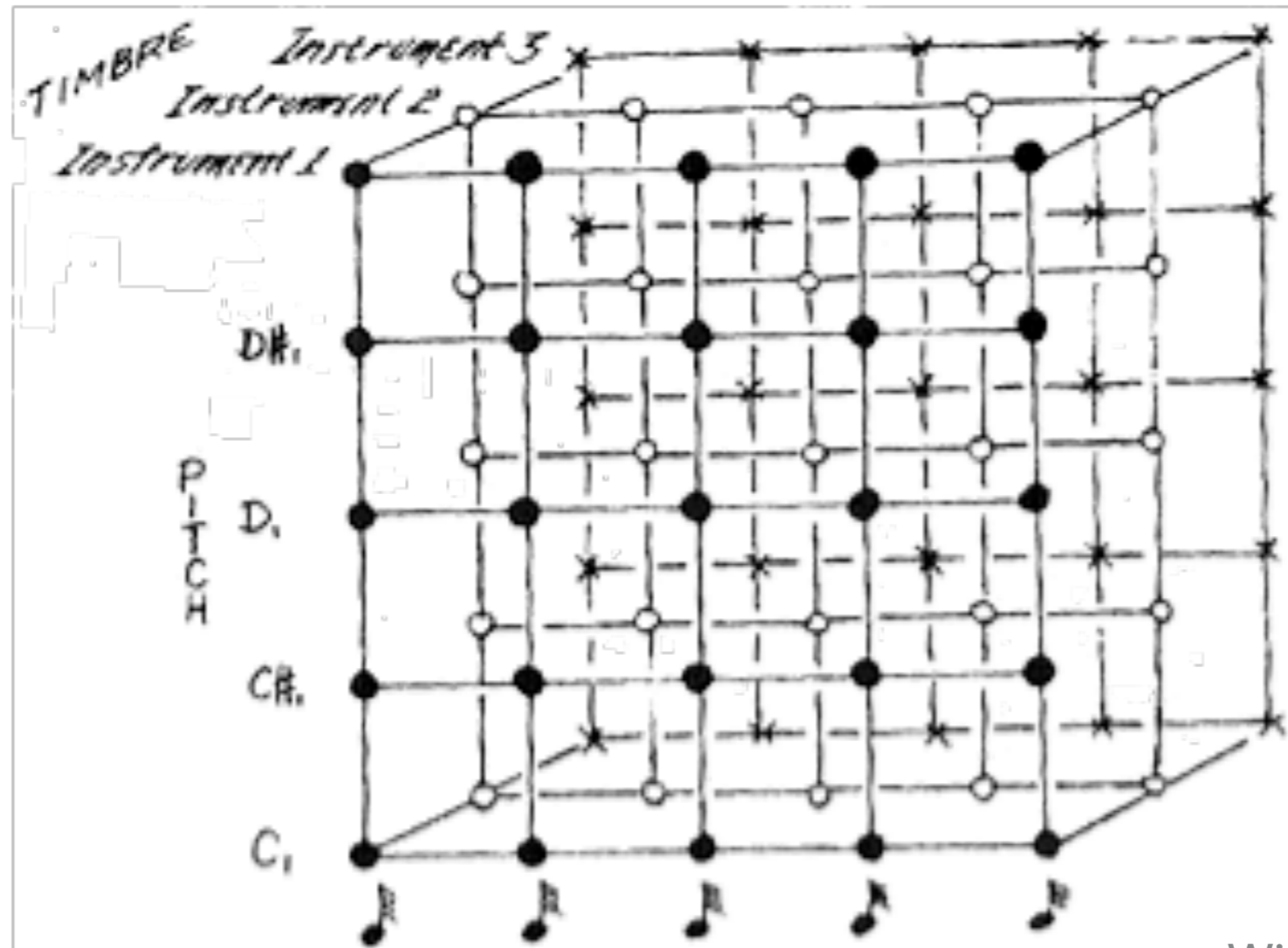
3rd signal
Downswing (DS)

TS

TIME LEVELS

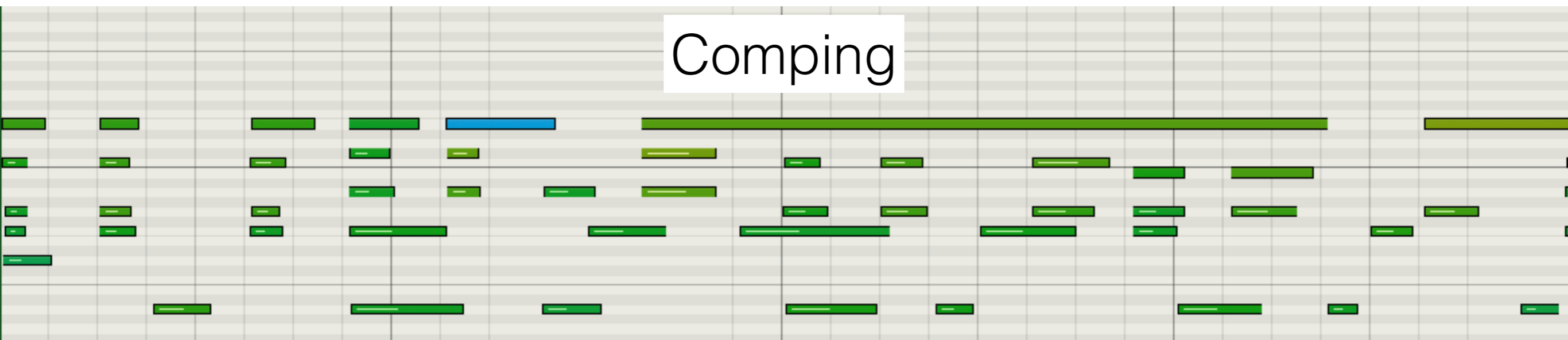
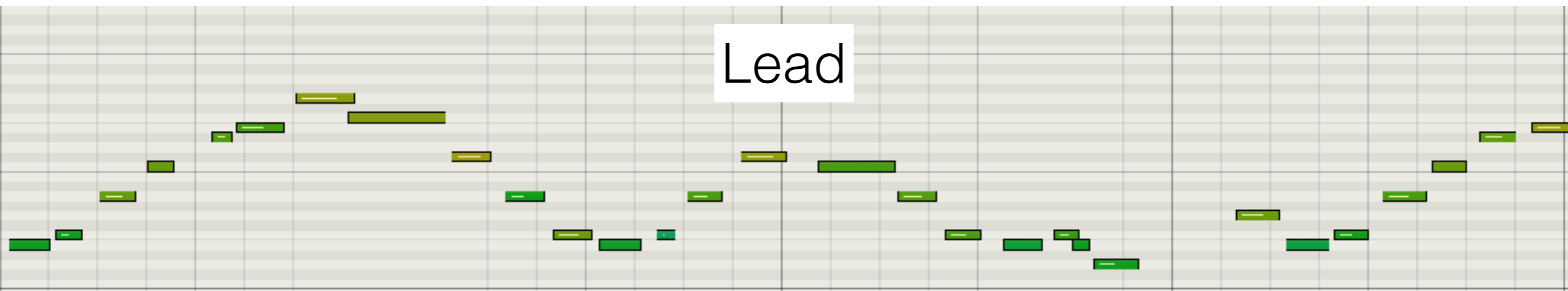


RHYTHM CONTINUUM



Wishart

LATENCY BY ENSEMBLE ROLE



Steve Hamilton on *Seta Para Una* (Mermikides 2014)

THE TYRANNICAL METRONOME



- ▶ Continually exerting what is correct (with little stylistic awareness)
- ▶ Offers no feedback (negative or positive)
- ▶ Can be ignored/rarely (though not ever) enjoyable or creative. Corrective over creative/developmental/illuminating.
- ▶ Speed over control?

EXTENDED METRONOME

- ▶ Provides Feedback
- ▶ Allows active integration with style and what 'correct' time is.
- ▶ A hybrid of analytical/training/compositional/improvisational tool

REPRESENTATIONS OF TIME



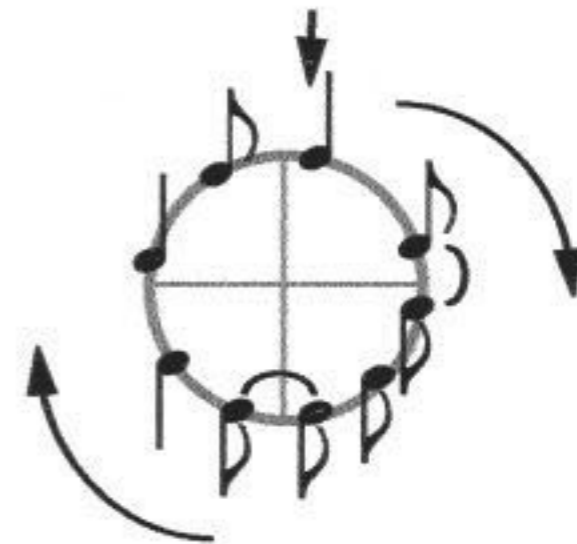
ARROW OF TIME

REPRESENTATIONS OF TIME

Time line



Time Cycle

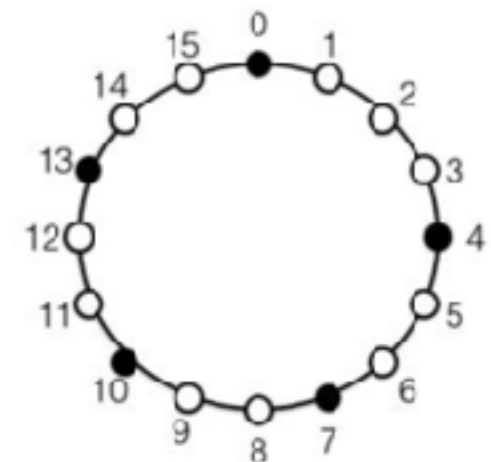
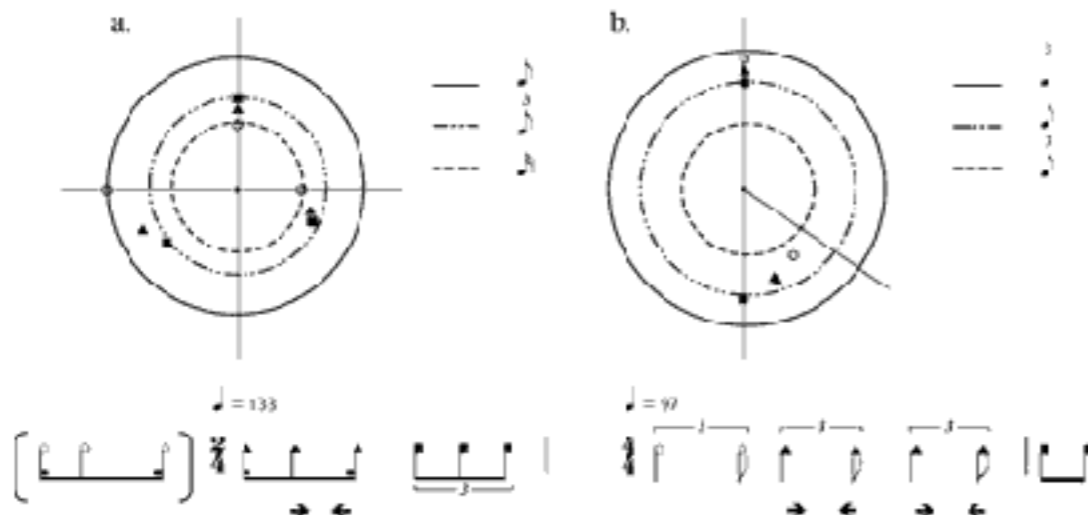
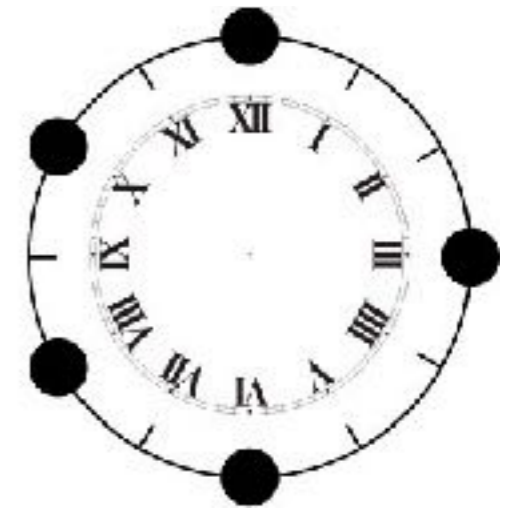


CIRCULAR TIME

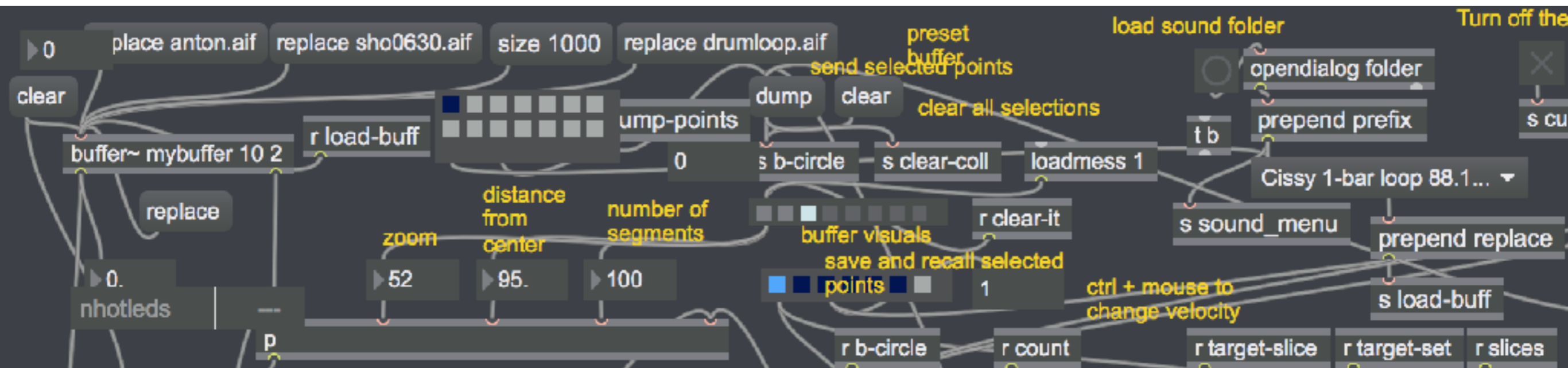
- ▶ Cyclical nature of (many) musical styles acknowledged
- ▶ Rhythmic subdivisions as helpful angular/polygon representations
- ▶ Immediate and visceral appreciation of time

CIRCULAR REPRESENTATIONS OF TIME

- ▶ 1252, a geometric cyclical representation of rhythm was theorised by Safi al-Din al-Urnawi
- ▶ West African Drumming Anku (2000)
- ▶ Flamenco Clock
- ▶ Benadon's (2007) representation of the beat/tactus
- ▶ Taylor (2009), London (2012), Osborn (2014) Rhythmic Necklace



MAX/MSP



DEMO

REFLECTIONS

- ▶ Provides (a range of) **feedback** gauging performance/development
- ▶ Tackles '**Red Light**' syndrome, active rather than passive practice
- ▶ **Blends** the Tactus/Tatum Time Levels with Meter/Hypermeter Levels. Swing Values to Polymeter, Flamenco Compas etc.
- ▶ Puts Expressive microtiming at the centre of practice rather than as a 'deviation' from 'correct' time. Feel-informed theory.
- ▶ Link to ethnomusicology and rhythmic theory
- ▶ Integrates audio from the 'real world' - analytical as well as pedagogical tool
- ▶ Rather an elegant approach to 'micro-rhythm' rather than 'micro-timing' IOI
- ▶ Novel (and we think useful) perspective on circular time and integration of time levels (including tuning).

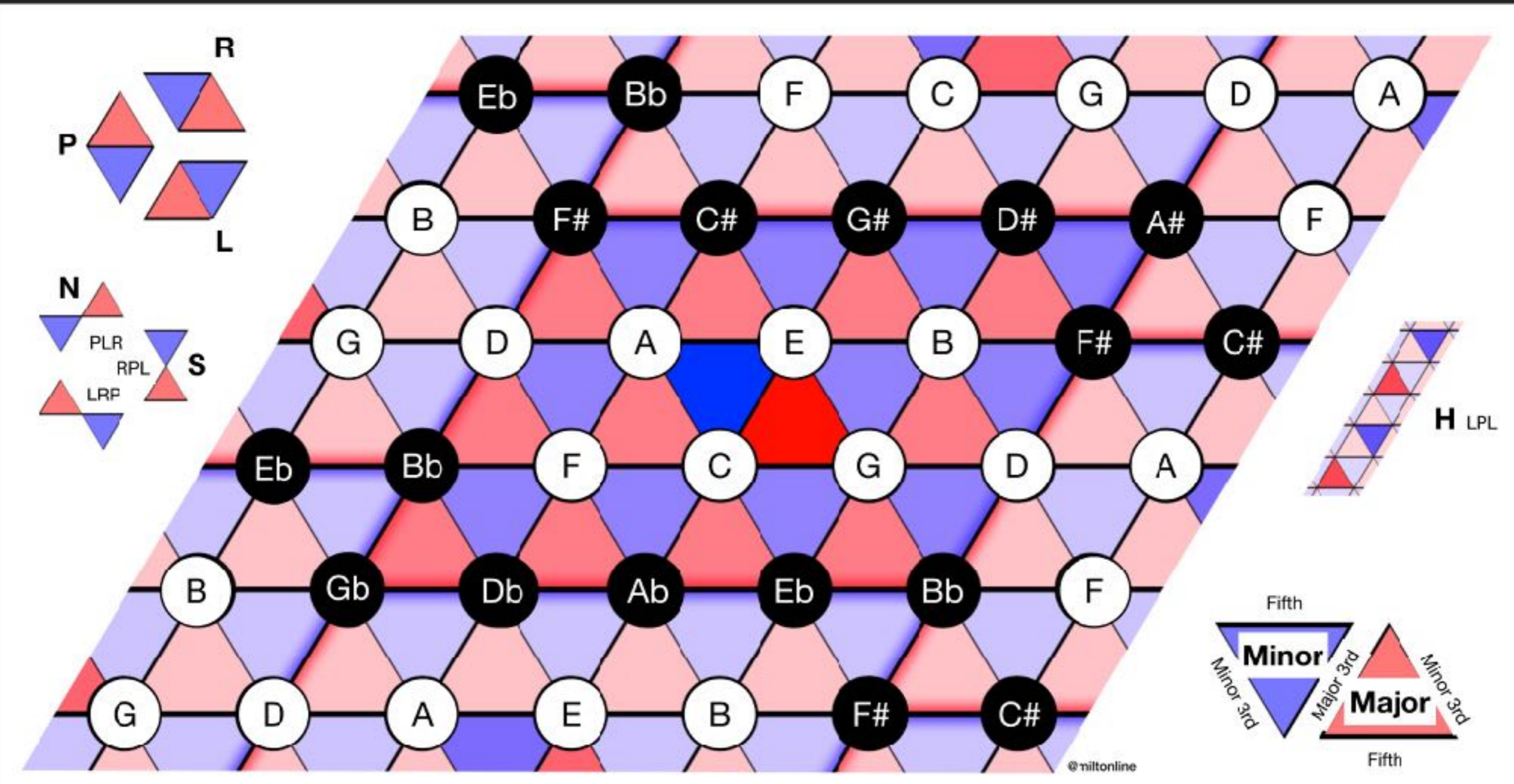
IDEAS

- ▶ Audio Inpu/Multitrack
- ▶ Audio Time Stretch/tune
- ▶ Instant analyser
- ▶ Multiple concentric circles/ looper spiral
- ▶ Transient detection
- ▶ Drag and drop
- ▶ Tempo change/metric modulation trainer
- ▶ Training game/ Drop Beats etc
- ▶ Stylistic backing track integration
- ▶ **Online/open Testing/development**

OTHER (INTEGRATED) PROJECTS

- ▶ Extended Tuner
(microtonal/development/compositional)
- ▶ Arvo Pärt Player
- ▶ Reich Machine
- ▶ Post Fripper-tronic/Eno/Lucier/Ligeti/
Stockhausen/Rweski/Riley
- ▶ Xenakis/Schillinger/Slonimsky/Bartok
- ▶ Neo-Riemannian Fretboard
- ▶ ETC.

FRETBOARD TONNETZ



MICROTONAL UNIVERSE

	1/729 -12c	1/243 -10c	1/81 -8c	1/27 -6c	1/9 -4c	1/3 -2c	1 +0c	3 +2c	9 +4c	27 +6c	81 +8c	243 +10c	729 +12c
625 -55c	Bb. 1250/729 934c	F. 625/485 435c	C. 625/324 1137c	G. 625/432 639c	D. 625/576 141c	A-- 625/384 843c	E-- 625/512 345c	B-- 1875/1024 1047c	F#+ 5625/4096 549c	Db+ 18875/16384 51c	Ab> 50825/32768 753c	Eb> you dont want 255c	Bb> toknowsrly 957c
125 -41c	F#. 1000/729 547c	Db. 250/243 49c	Ab-- 125/81 751c	Eb-- 125/108 253c	Bb-- 125/72 955c	F-- 125/96 456c	C-- 125/64 1159c	G-- 375/256 661c	D-- 1125/1024 163c	A 3375/2048 865c	E 10125/8192 367c	B 135/128 1069c	F#> 729/512 571c
25 -27c	D-- 800/729 161c	A- 400/243 863c	E- 100/81 365c	B- 50/27 1087c	F#-- 25/18 569c	Db-- 25/24 71c	Ab- 25/16 773c	Eb- 75/64 275c	Bb- 225/128 977c	F- 675/512 478c	C- 2025/1024 1180c	G 6075/4096 682c	D 18225/26384 184c
5 -14c	Bb- 1280/729 974c	F- 320/243 476c	C- 160/81 1118c	G- 40/27 640c	D- 10/9 182c	A 5/3 884c	E 5/4 386c	B 15/8 1088c	F#- 45/32 590c	C#- 135/128 92c	Ab> 405/64 792c	Eb> 1215/1024 294c	Bb> 3645/256 998c
1	F#< 512/729 588c	Db< 256/243 90c	Ab 128/81 792c	Eb 32/27 294c	Bb 16/9 996c	F 4/3 498c	C 1/1 0c	G 3/2 702c	D 9/8 204c	A+ 27/16 906c	E+ 81/64 408c	B+ 243/128 1110	F#> 729/512 612
1/5 +14c	D-/ 4095/3645 202c	A+< 2048/1215 904c	E+< 512/405 406c	B+< 256/135 1108c	F# 64/45 610c	Db 16/15 112c	Ab+ 8/5 814c	Eb+ 6/5 316c	Bb+ 9/5 1018c	F+ 27/20 520c	C+ 81/80 22c	G+ 243/160 723c	D+> 729/640 225c
1/25 +27c	Bb+< 32768/16225 1016c	F+< 8192/8075 518c	C+< 2048/2025 20c	G+< 1024/675 722c	D+ 256/225 223c	A++ 128/75 925c	E++ 32/25 427c	B++ 48/25 1129c	F#+ 36/25 631c	Db+ 27/25 133c	Ab> 81/50 835c	Eb> 243/200 337c	Bb> 729/400 1039c
1/125 +41c	F#+< all in one 629c	Db+< 20768/20375 131c	Ab++ 16384/1125 833c	Eb++ 4096/3375 335c	Bb++ 2048/1125 1037c	F++ 512/375 539c	C++ 128/125 41c	G++ 192/125 743c	D++ 144/125 245c	A+> 216/125 947c	E+> 162/125 449c	B+> 243/125 1151c	F#> 729/500 653c
1/625 +55c	D/ dont ask 243c	A+++< long 945c	E+++< 5536/53625 447c	B+++< 32768/16875 1148c	Bb+++ 2048/1875 851c	Db+++ 16/15 153c	Ab+> 1024/625 855c	Eb+> 768/625 357c	Bb+> 1152/625 1059c	F+> 864/625 561c	C+> 648/625 63c	G+> 972/625 765c	D+> 729/625 266c

TINTINNABULI

(a) first position, superior (+1)

second position, superior (+2)

T-voice a minor triad



M-voice

(b) first position, inferior (-1)

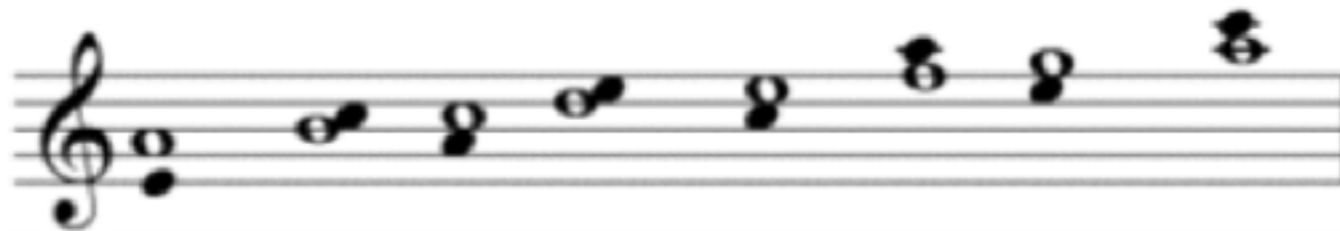
second position, inferior (-2)

M-voice



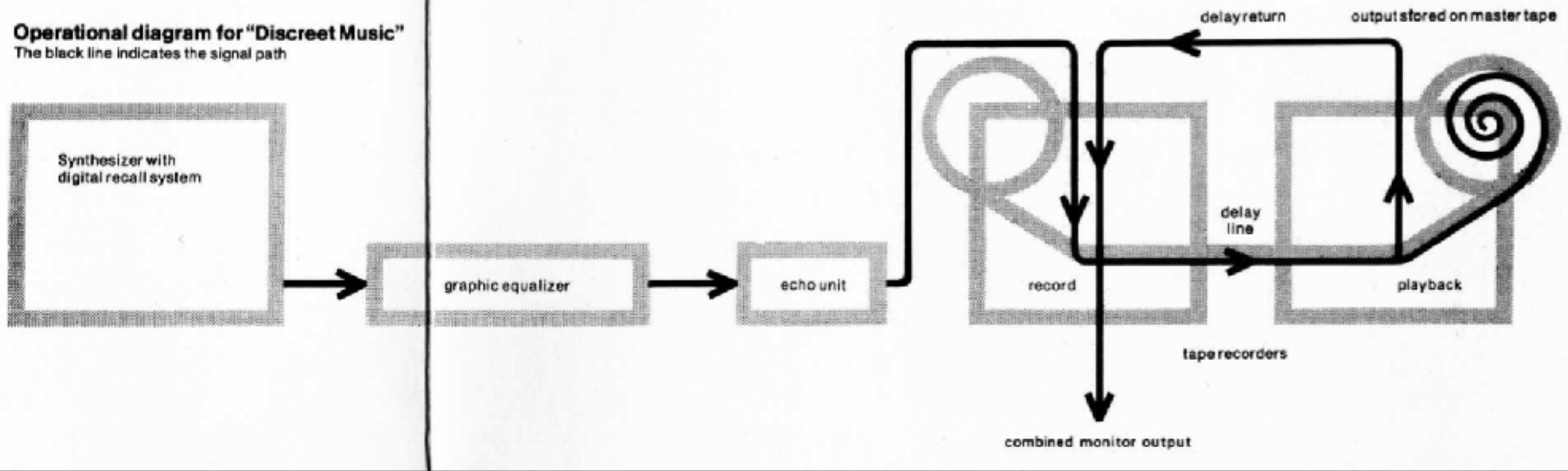
T-voice a minor triad

(c) first position, alternating inferior and superior (-1/+1)



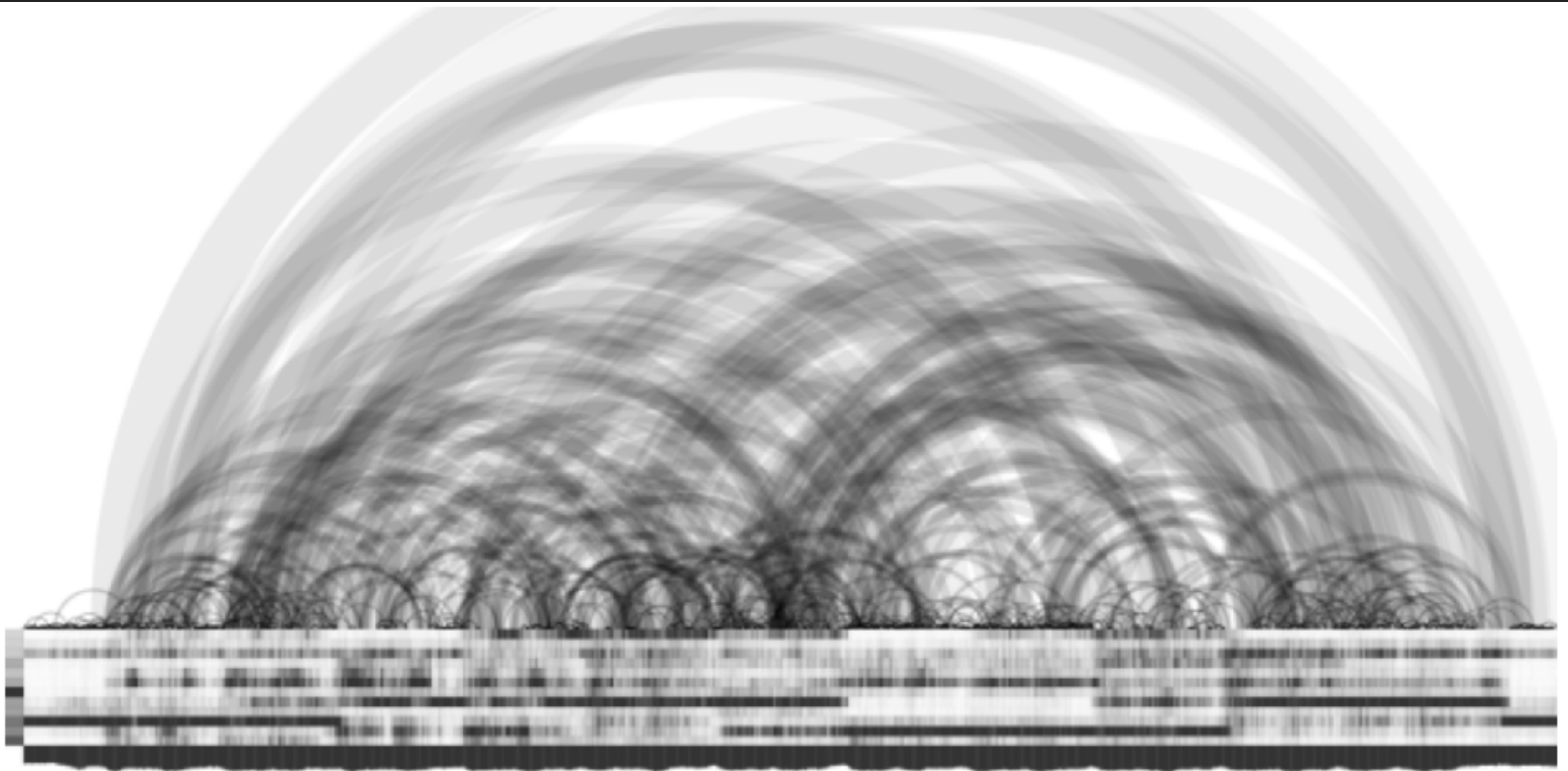
FEEDBACK SYSTEMS

Operational diagram for "Discreet Music"
The black line indicates the signal path



EXTENDED GUITAR - MERMIKIDES/FAIA

CANONIC/SIMILARITY MACHINES ETC



POSSIBLE NAMES

FEEDBACK METRONOME

METROGNOME

MINGUS (**METRONOME IN DISGUISE**)

KRONOS

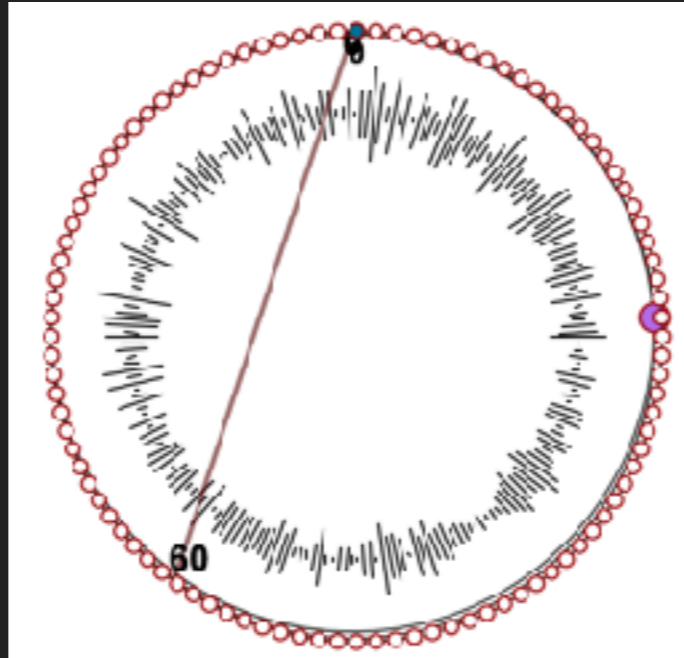
TIM-E

BLINK METRONOME

BIG TIME

GROOVOMETER

TIME MACHINE



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