

Musikkteknologi

Alexander Refsum Jensenius

musikkvitenskap

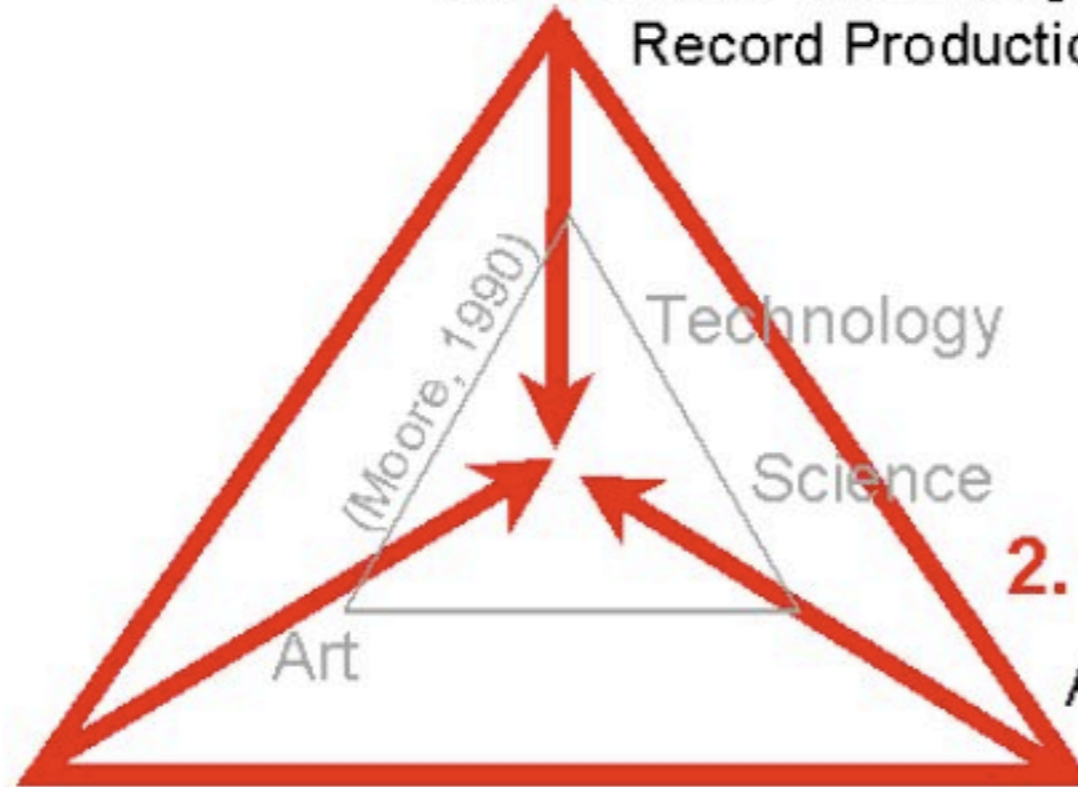


musikkteknologi

Modeller

1. "Music Technology" [1]

As in Sound Recording, Tonmeister, Record Production, etc

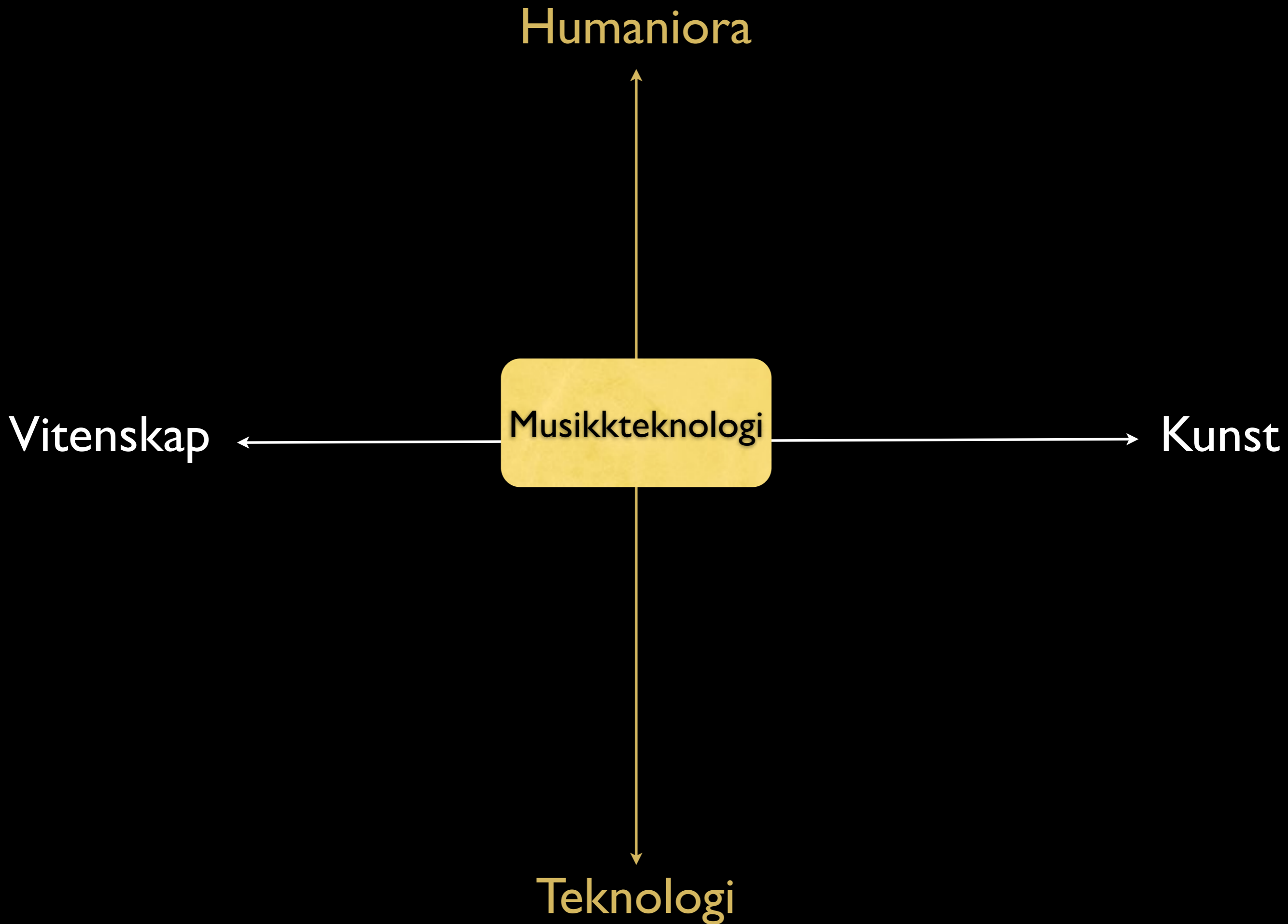


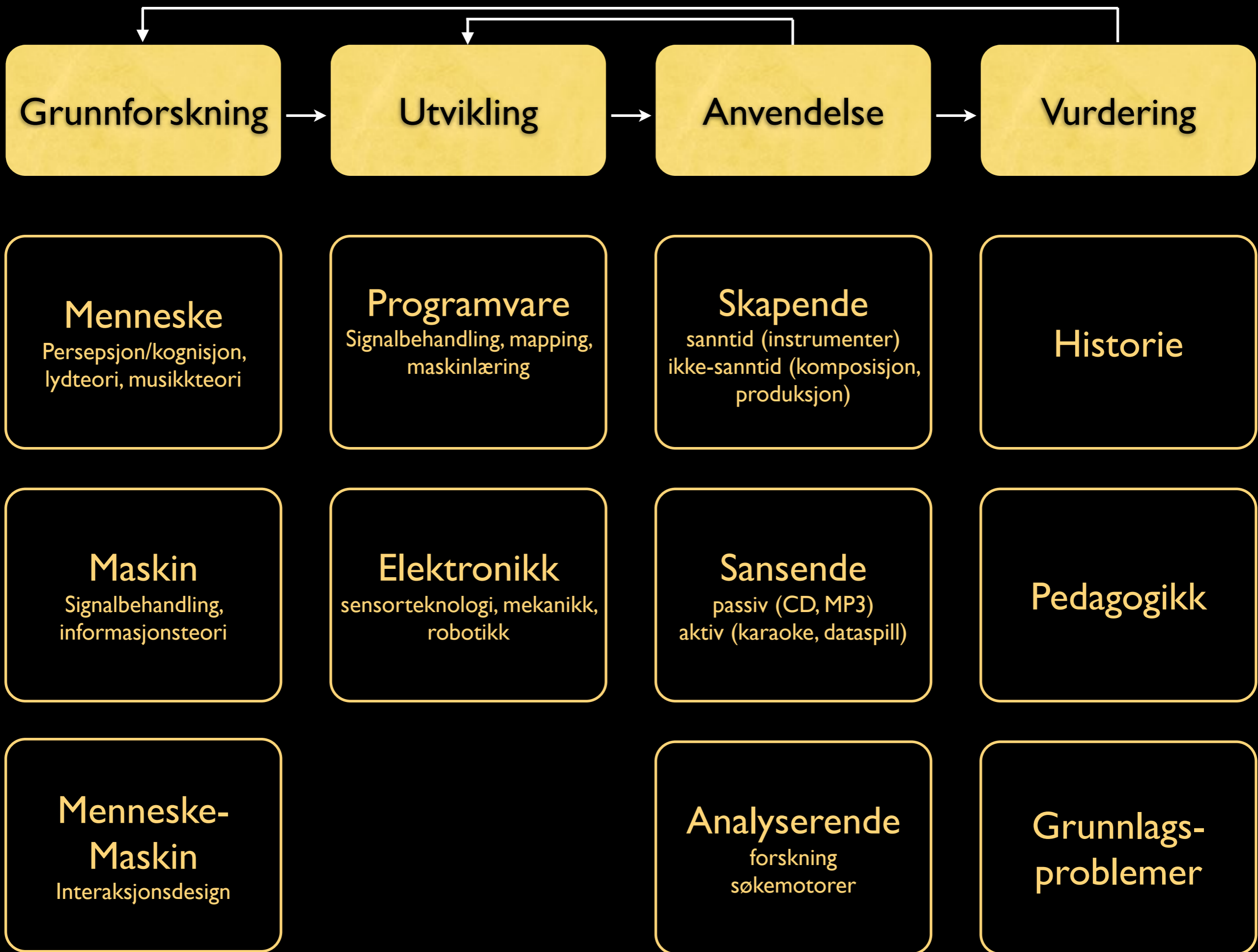
2. "Music Technology"

As in Computational Musicology, Electronic, Audio and Music Technology Engineering, Music Informatics, Music Technology Soft/Hardware Development, Digital Music

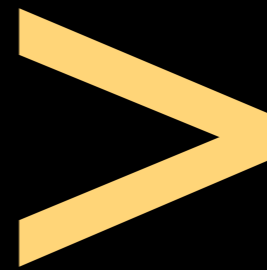
3. "Music Technology"

As in Creative Music Technology, Sonic Arts, Electro-acoustic Composition, Sound Design, Electronic Music





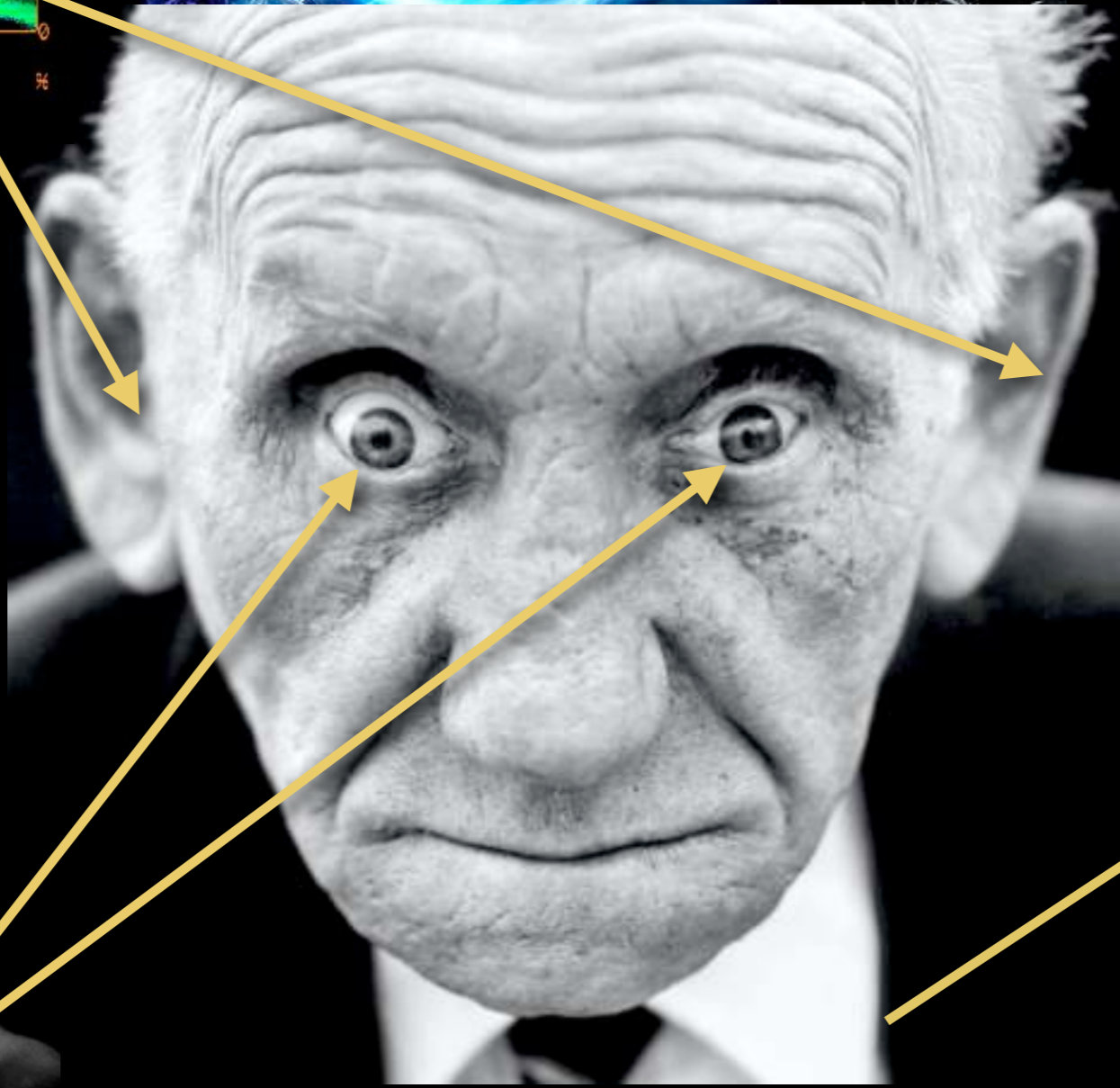
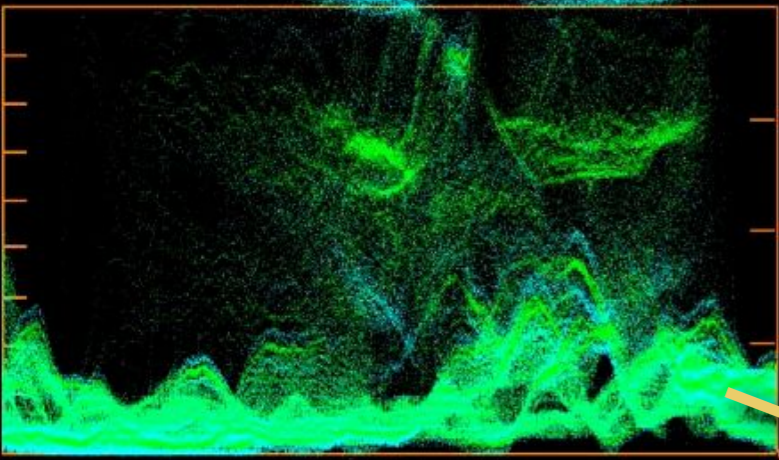
Musikk- og medieteknologi



Bilindustri

Forskning

Musikkognisjon



“music”

Embodied Music Cognition



Musikkinformatikk

Music Information Retrieval (MIR)

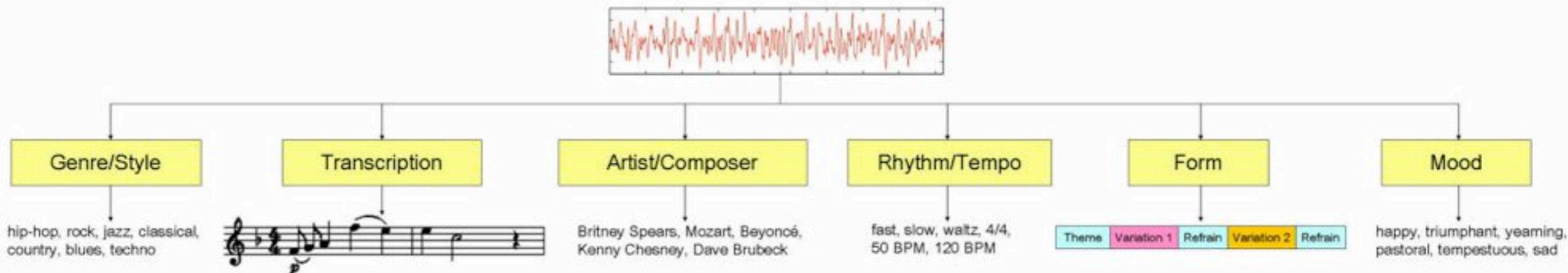


Scene Analysis for Music Understanding

A. JAMES CLARK
SCHOOL OF ENGINEERING

Steven K. Tjoa and K. J. Ray Liu (Signals and Information Group)

Problem: What semantic, musical information can a digital music signal provide?



Applications:

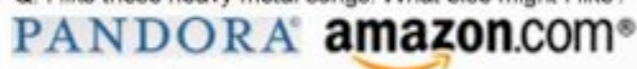
• Search and Retrieval

- Q: Find a hip-hop dance beat, 110 BPM.
- Q: Find a song with this melody: <whistle, hum>



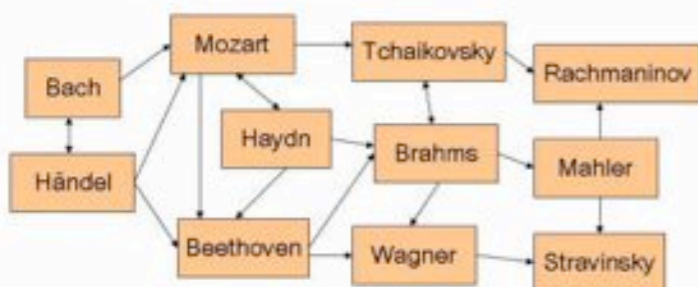
• Recommendation

- Q: I like these heavy metal songs. What else might I like?



• Musicological Analysis

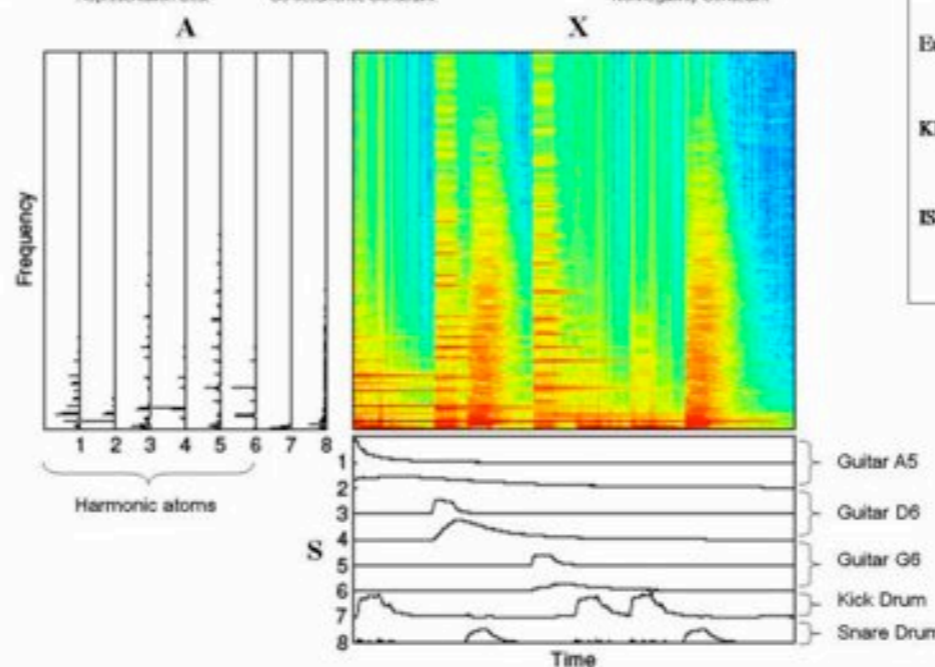
- Q: How do musical trends evolve?



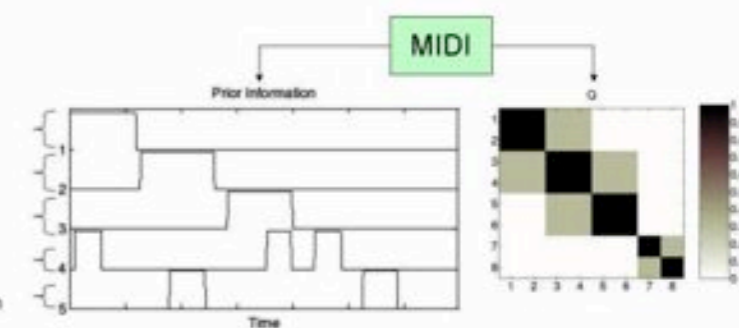
Our Contributions: Scene Analysis and Source Separation.

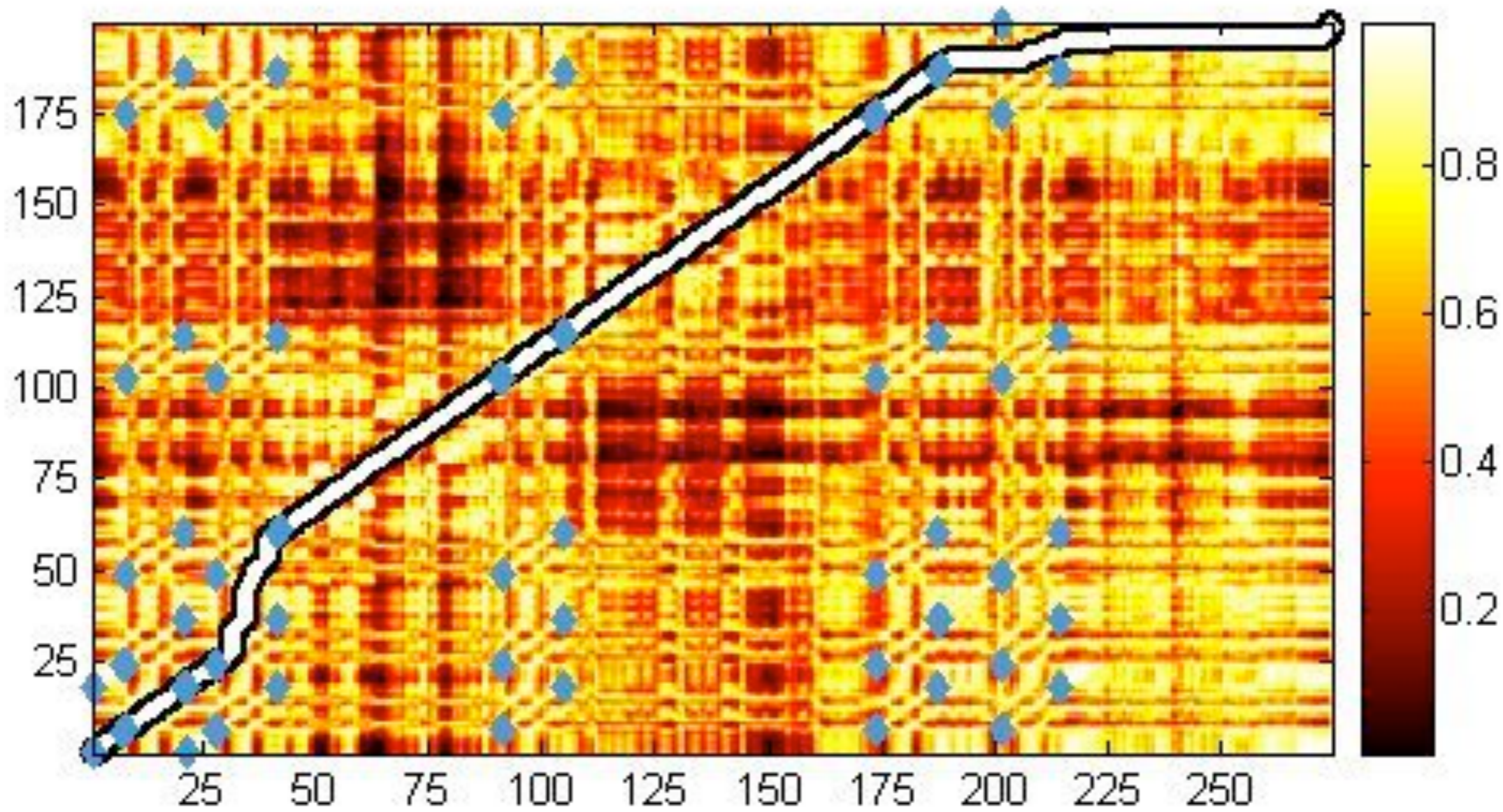
- Can improve the performance of other tasks in music understanding.
- Use **nonnegative matrix factorization (NMF)** algorithms to decompose spectrograms into musical events.
- Seamlessly integrate **co-occurrence constraints, harmonic constraints, and prior information** to improve NMF.

$$\min_{A,S} \underbrace{d(X, AS)}_{\text{Representation Cost}} + \underbrace{d(Q, SS^T)}_{\text{Co-occurrence Constraint}} \quad \text{s.t.} \quad \underbrace{A \in R_+^{M \times K}}_{\text{Nonnegativity Constraint}}, S \in R_+^{K \times N}$$



NMF Update Rules:	with co-occurrence constraints:
$\text{Enc: } A \leftarrow A \cdot \frac{XS^T}{ASS^T} \quad S \leftarrow S \cdot \frac{A^T X}{A^T AS}$	$\text{Enc: } A \leftarrow A \cdot \frac{AQ}{AA^T A} \quad S \leftarrow S \cdot \frac{QS}{SS^T S}$
$\text{KL: } A \leftarrow A \cdot \frac{X}{AS} S^T \quad S \leftarrow S \cdot \frac{A^T X}{A^T 1}$	$\text{KL: } A \leftarrow A \cdot \frac{Q}{A1} \quad S \leftarrow S \cdot \frac{Q}{1S}$
$\text{IS: } A \leftarrow A \cdot \frac{X}{(AS)^2} S^T \quad S \leftarrow S \cdot \frac{A^T X}{A^T \frac{1}{AS}}$	$\text{IS: } A \leftarrow A \cdot \frac{Q}{A(A^T A)^2} \quad S \leftarrow S \cdot \frac{Q}{(SS^T)^2 S}$



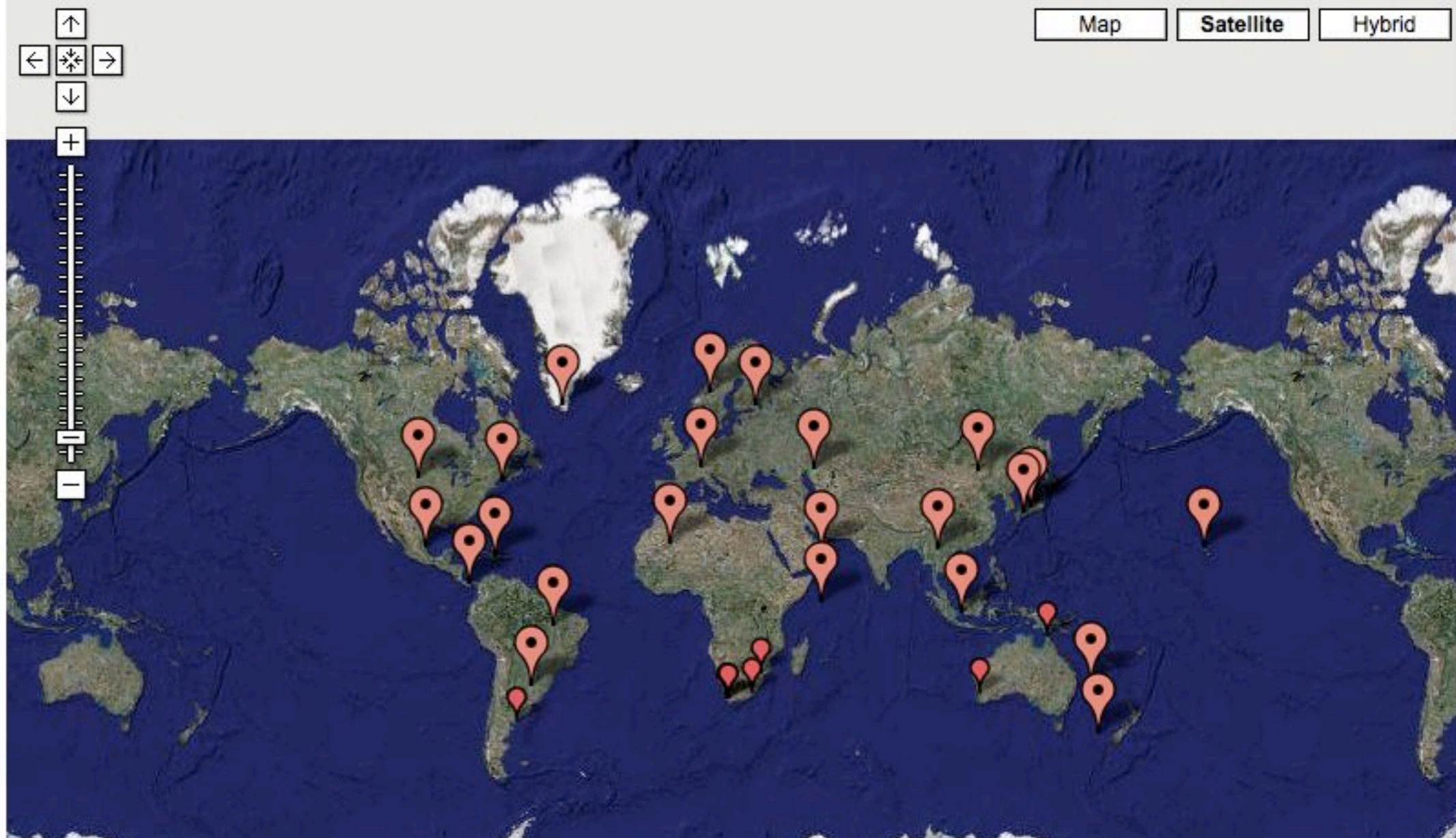


Geotagged sounds on freesound...

Please **let us know** if you have any comments or feedback about this page!

page 1 of 149 >>

- ▶ **00568 hard truck traffic 3** by **Robinhood76**
- ▶ **Owls** by **Benboncan**
- ▶ **soundscape colectivo1** by **sonsdebarcelona**
- ▶ **belek kylä fs** by **timofei**
- ▶ **linnutrixosFS** by **timofei**
- ▶ **rixospier fs** by **timofei**
- ▶ **rixosparvsellofs** by **timofei**
- ▶ **oulu 041008 makparveke** by **timofei**
- ▶ **Kemi 011008 klo 2128** by **timofei**
- ▶ **STE-047** by **bsumusictech**
- ▶ **STE-046** by **bsumusictech**
- ▶ **STE-045** by **bsumusictech**
- ▶ **STE-044** by **bsumusictech**
- ▶ **STE-042** by **bsumusictech**
- ▶ **STE-041** by **bsumusictech**
- ▶ **STE-040** by **bsumusictech**
- ▶ **obres raval0** by **sonsdebarcelona**
- ▶ **20081108.dancer** by **dobroide**
- ▶ **20081109.modern.art** by **dobroide**
- ▶ **[EXT] BeachBehindChrysalis** by **George Macklin**

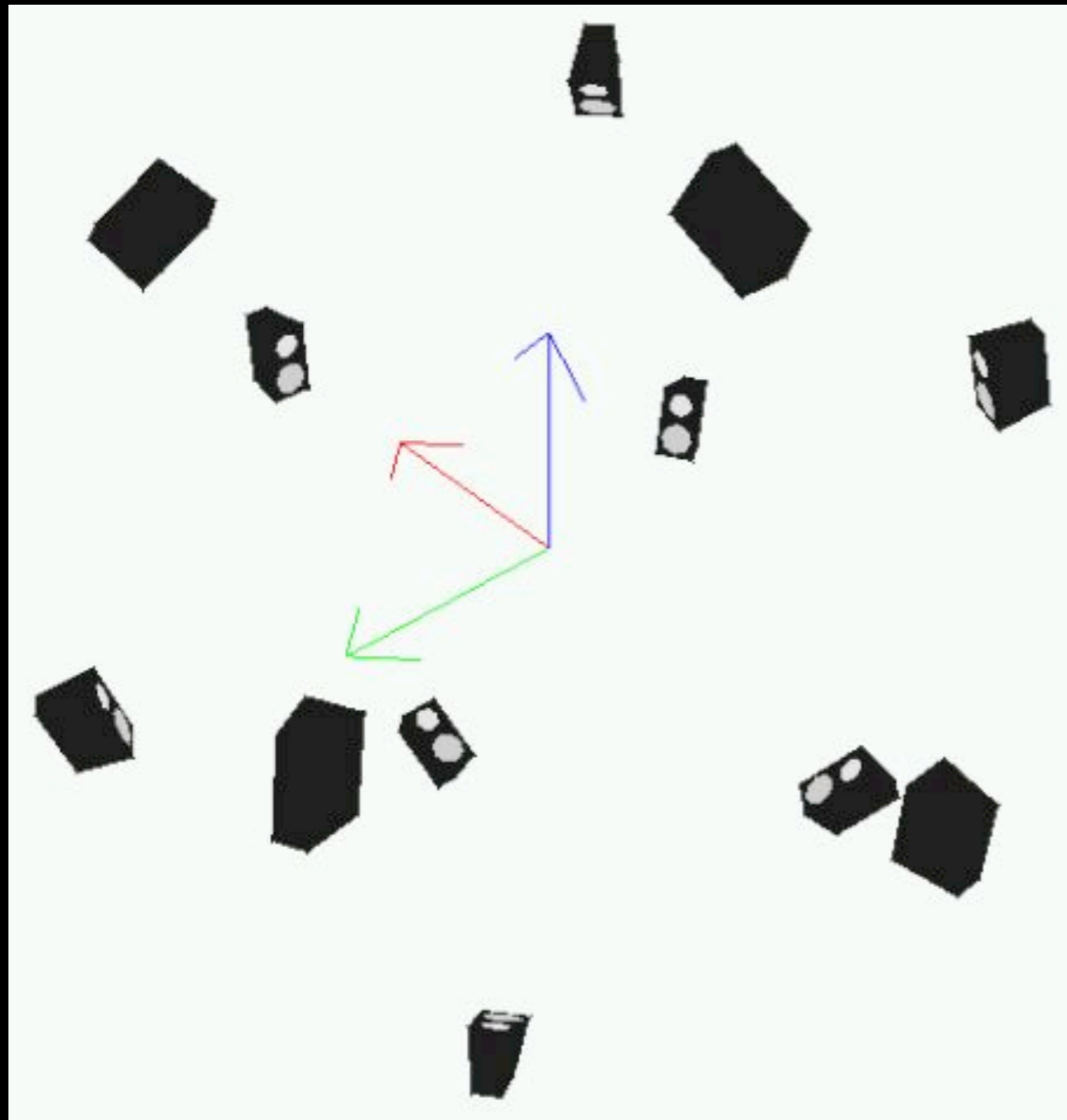


Signalbehandlung

Tristan Jehan, MIT

Konkatenativ syntese

Spatialisering



Ambisonics

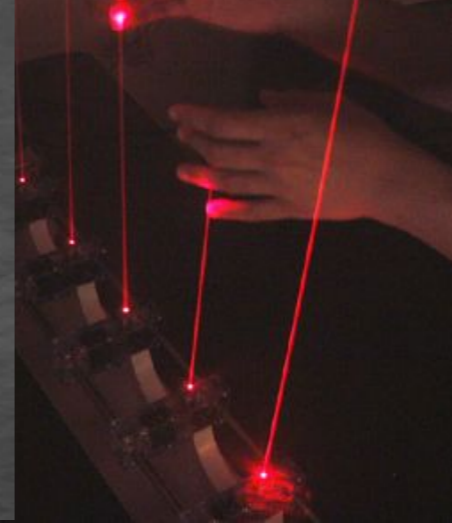


Natasha Barrett
Rom for kunst



Wavefield-syntese

NIME



NIME

New Interfaces for Musical Expression





Utfordring I

Bevegelse-lyd kobling

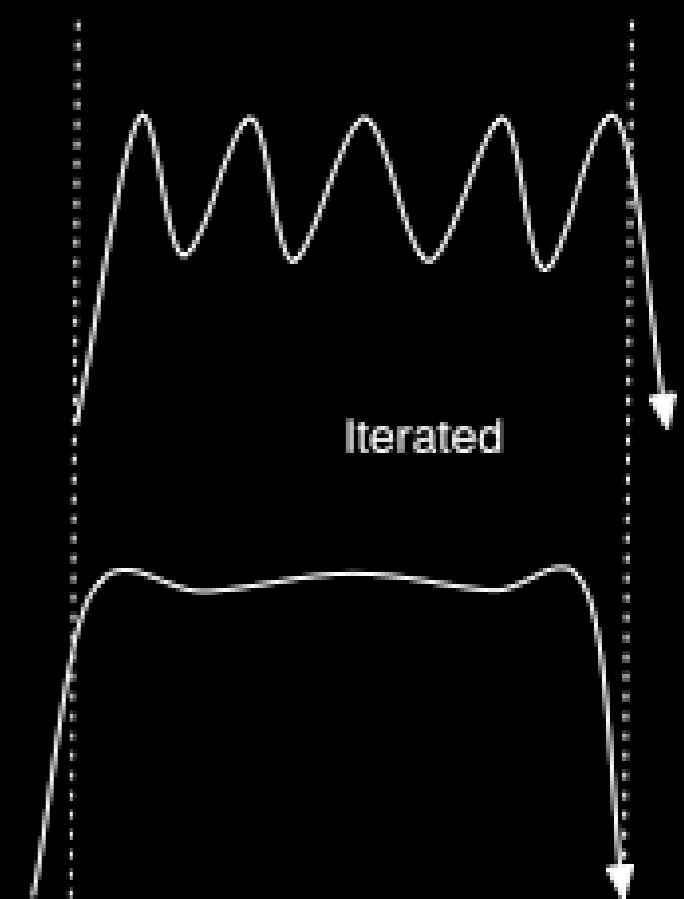
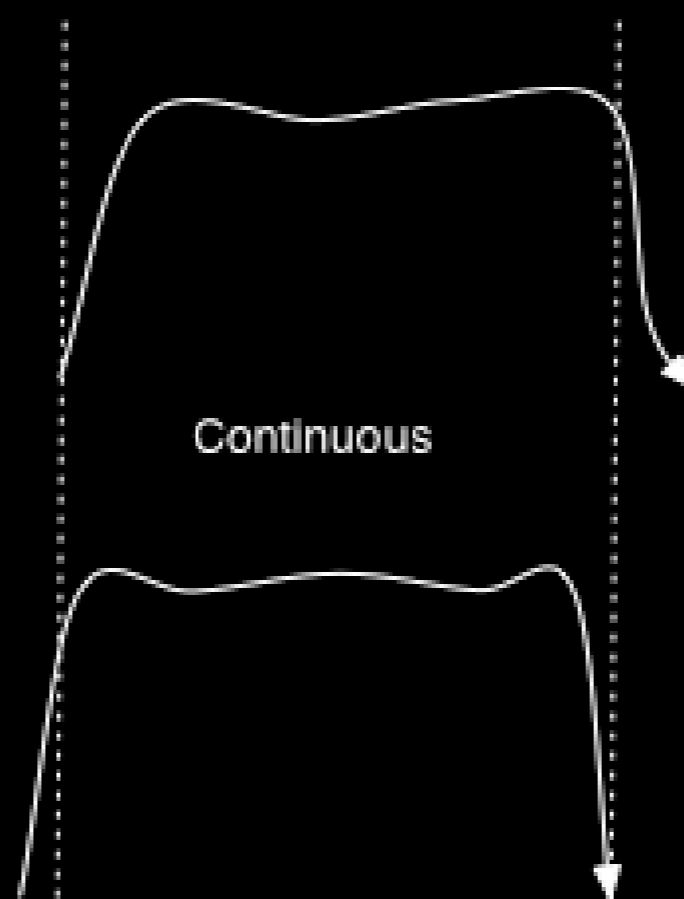
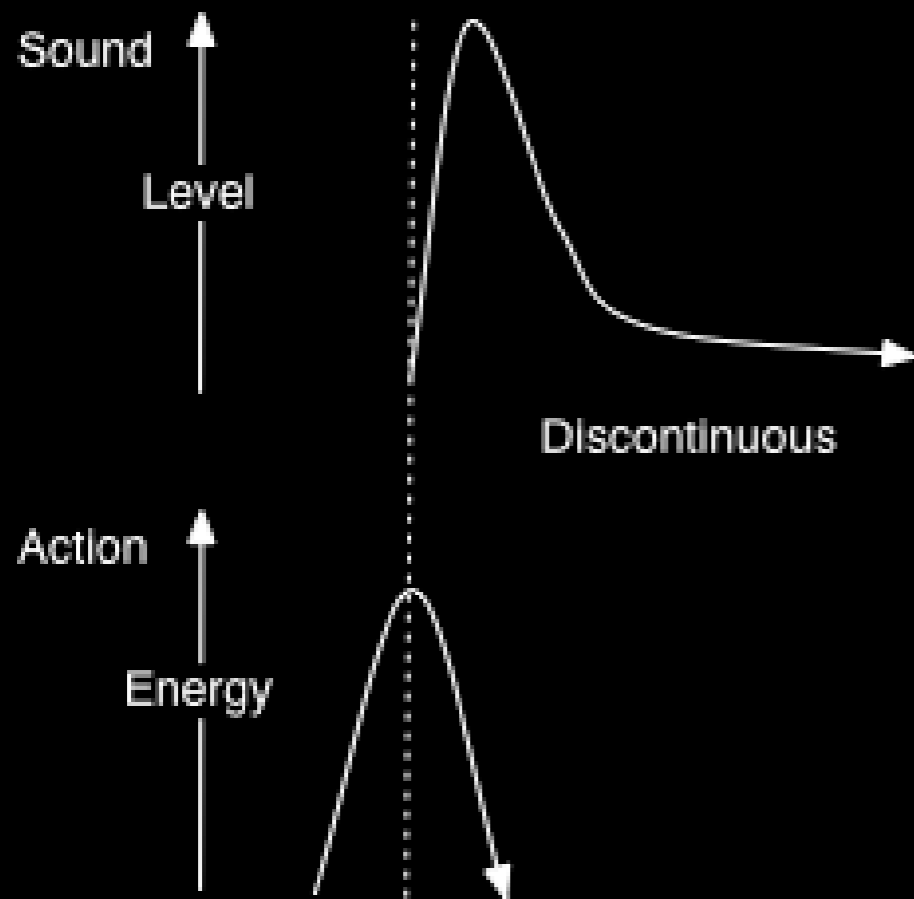




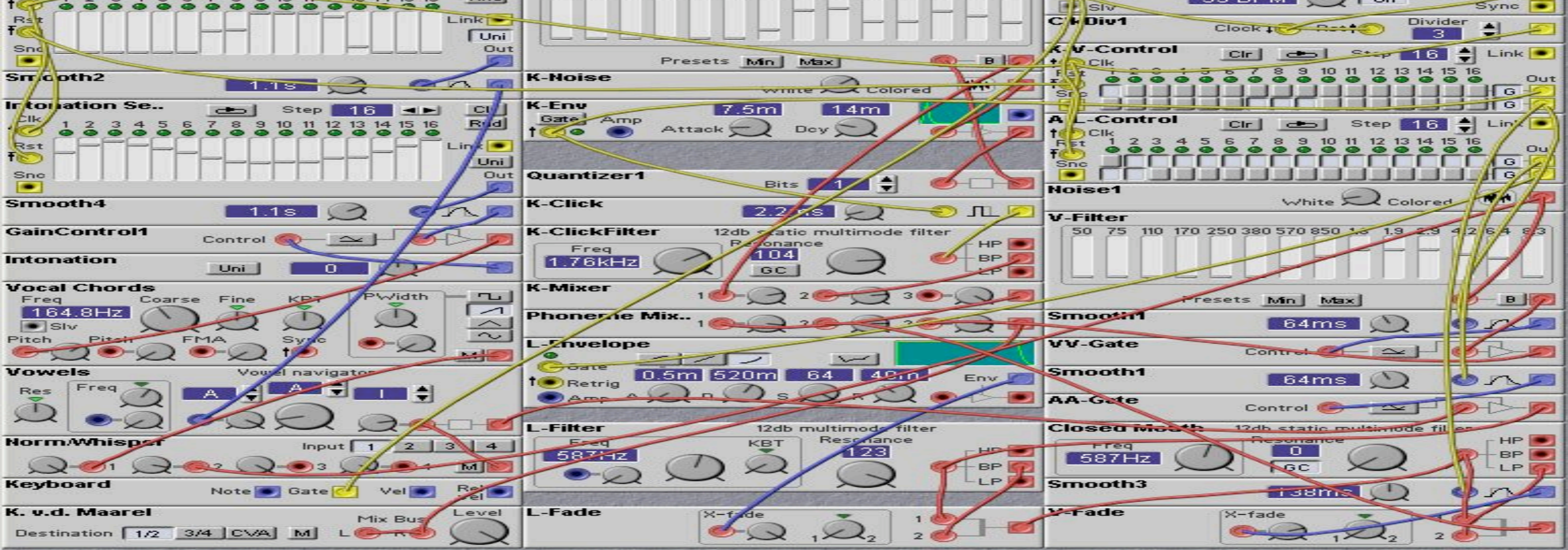
Diskontinuerlig

Kontinuerlig

Iterativ



time



Utfordring 2

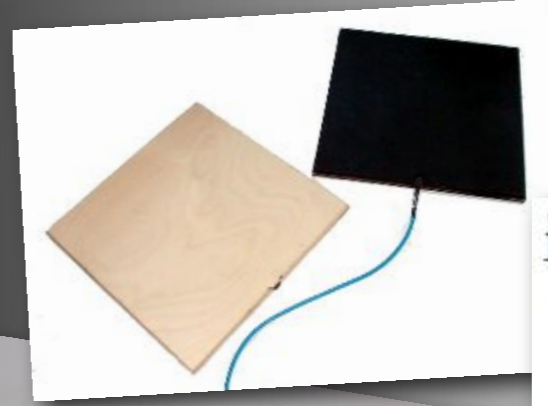
Kompleksitet





MIDI



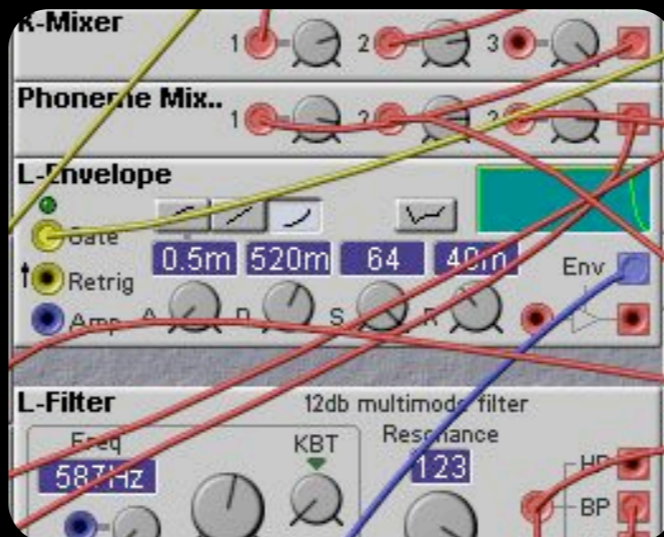




→
→
GDI
→
→



Gesture Description Interchange Format



Utfordring 3

Virtuositet



sound-producing:

excitation

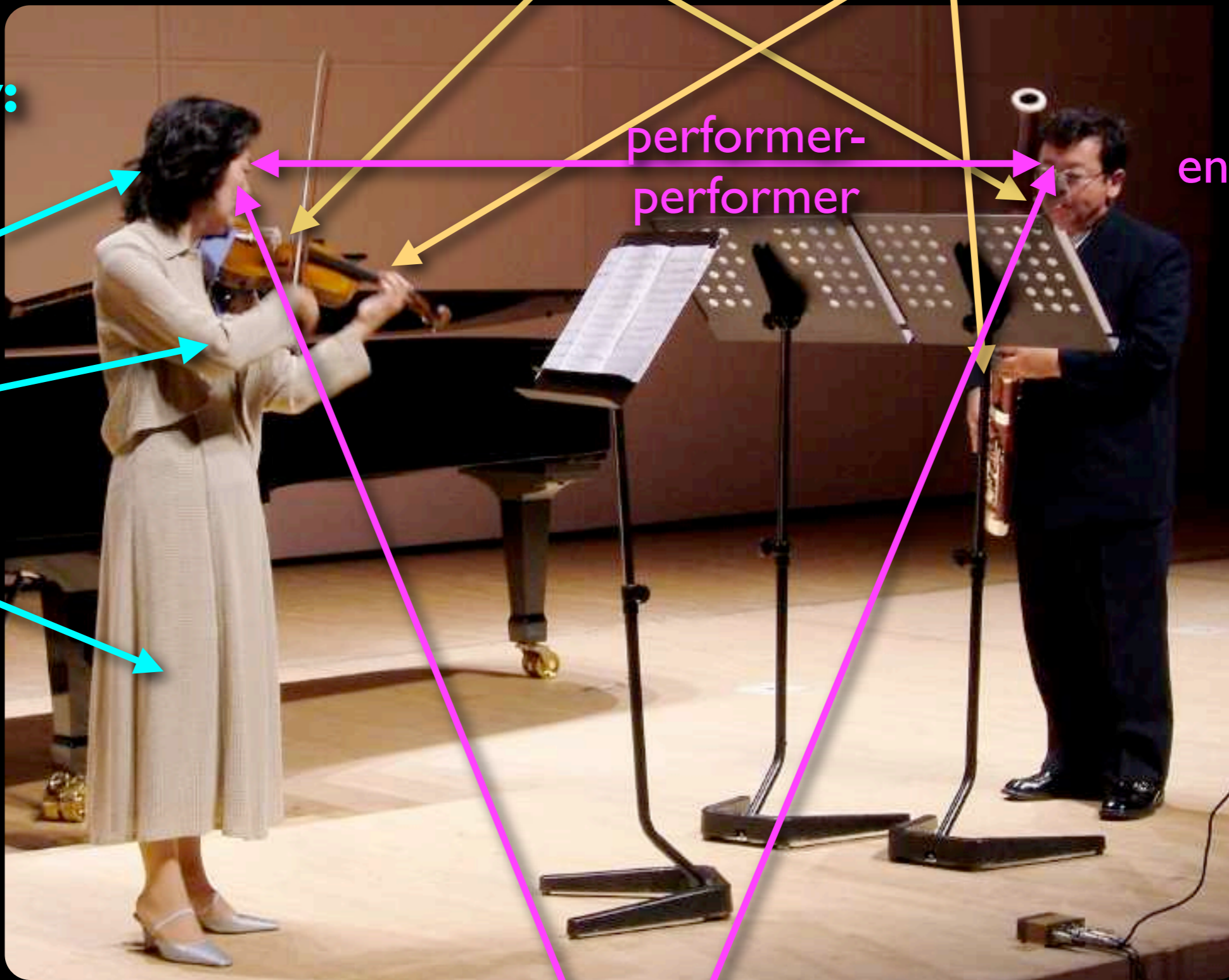
modification

ancillary:

phrasing

support

entrained



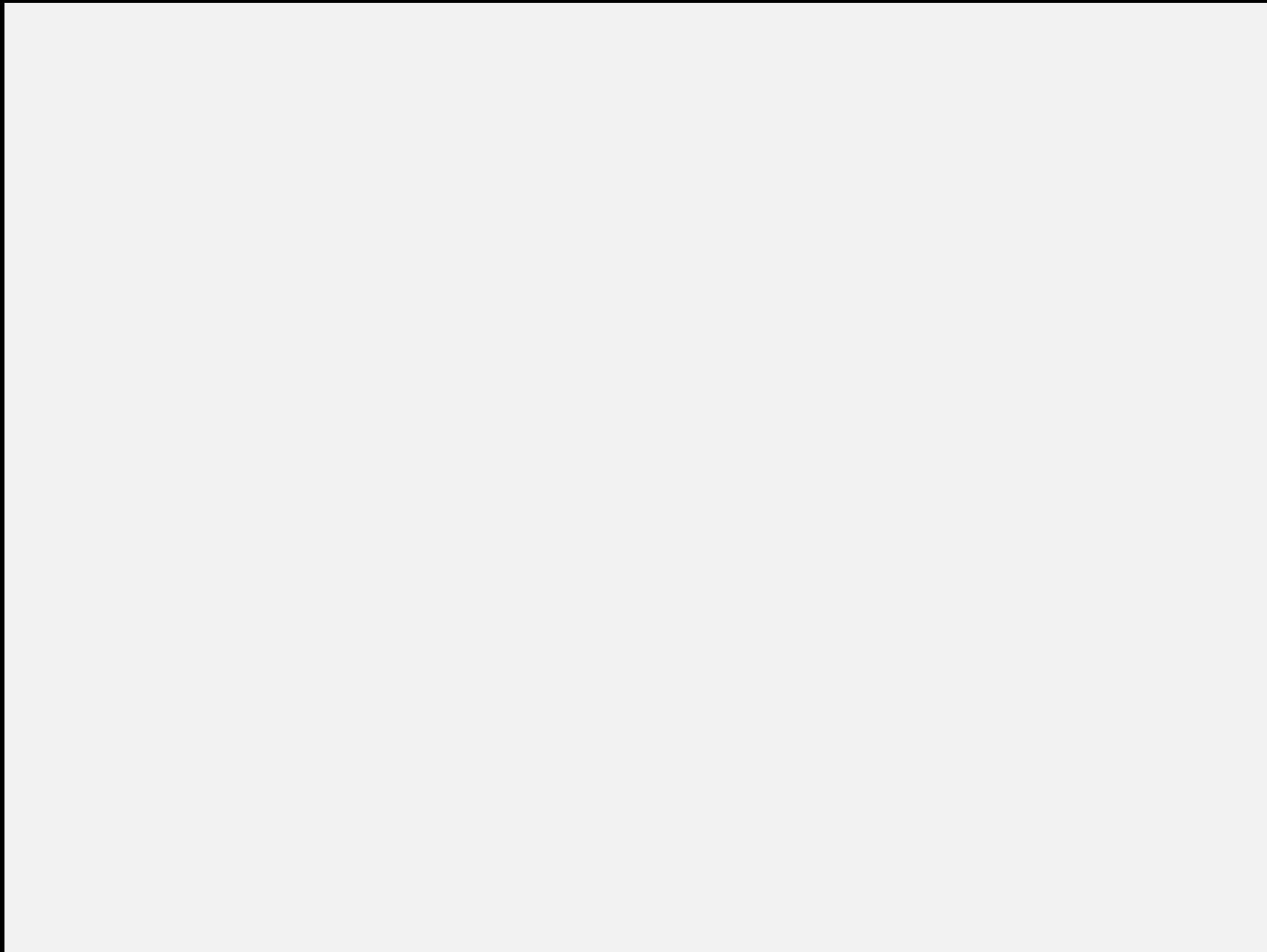
endogenous

performer-
performer

communicative:

performer-perceiver

NIME-eksempler



Petri Toiviainen

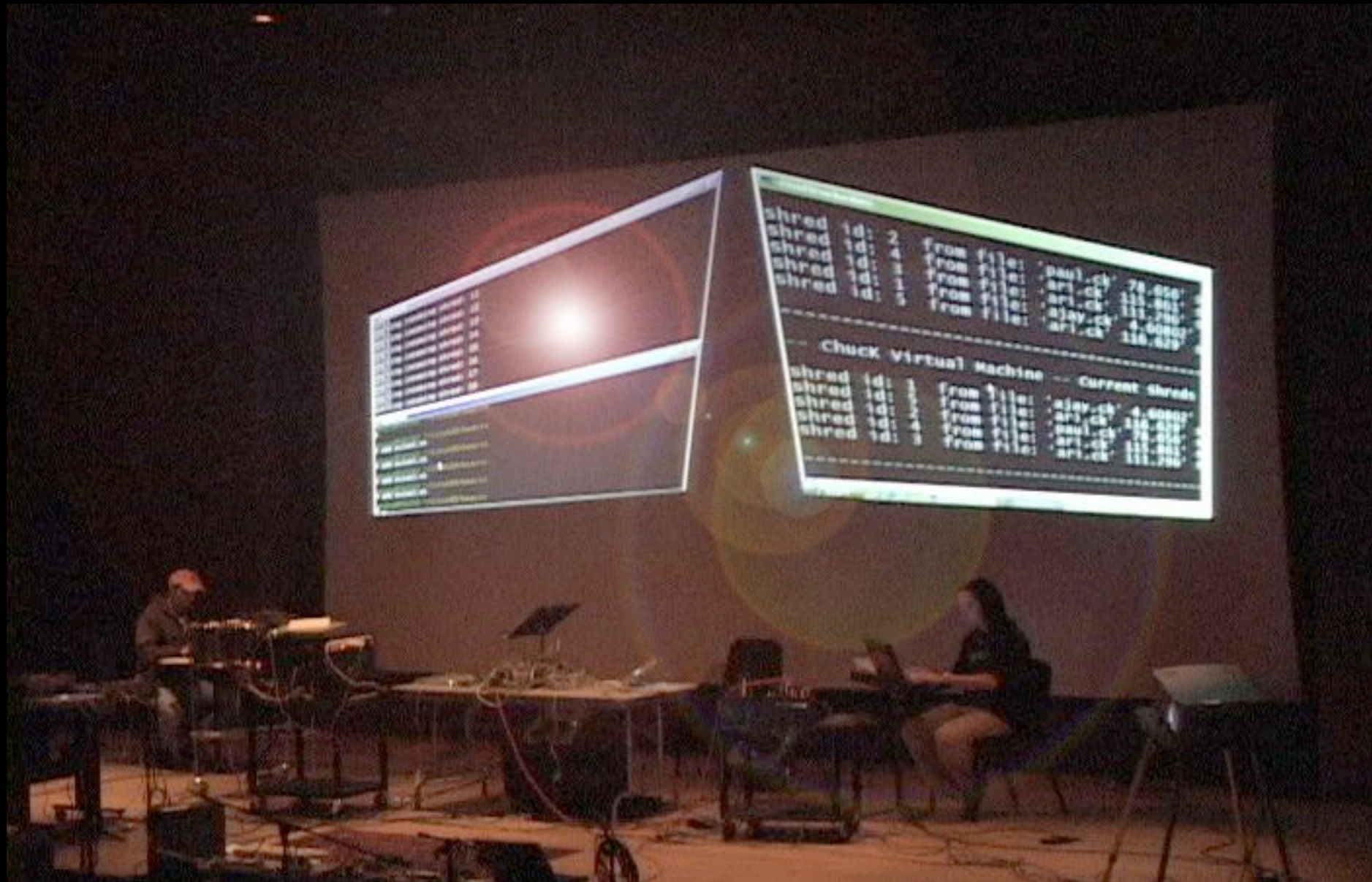


3'21" free improvisation

performed by
Sergi Jordà and Marcos Alonso
on September 6th, 2006

Reactable **Pompeu Fabra, Barcelona**





Sanntidskoding



PLORK



Princeton Laptop Orchestra

Menneske-maskin

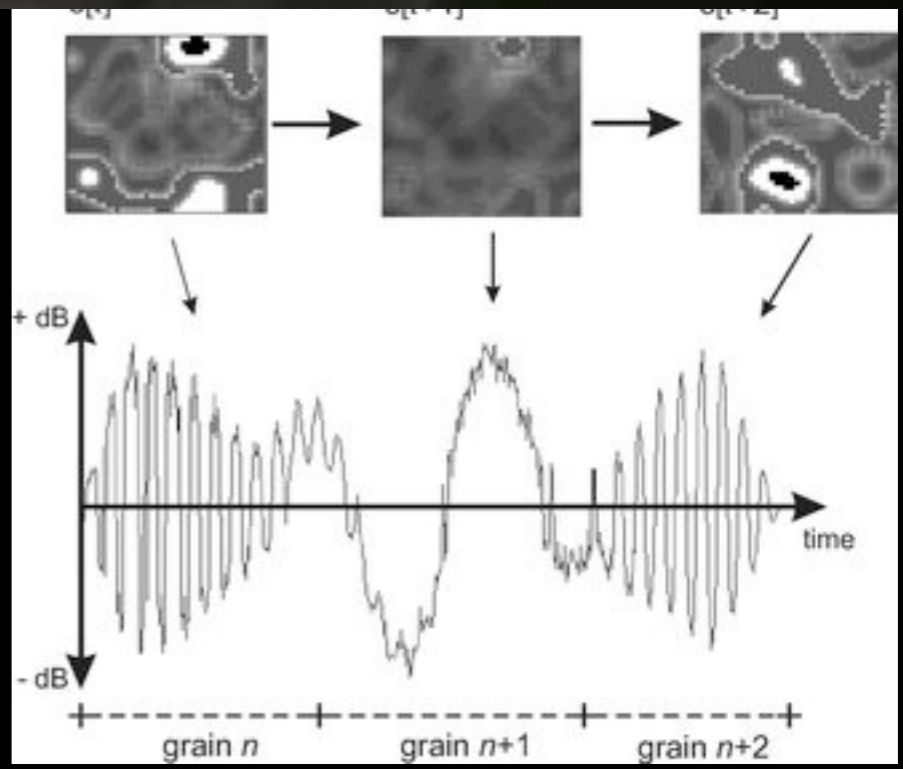
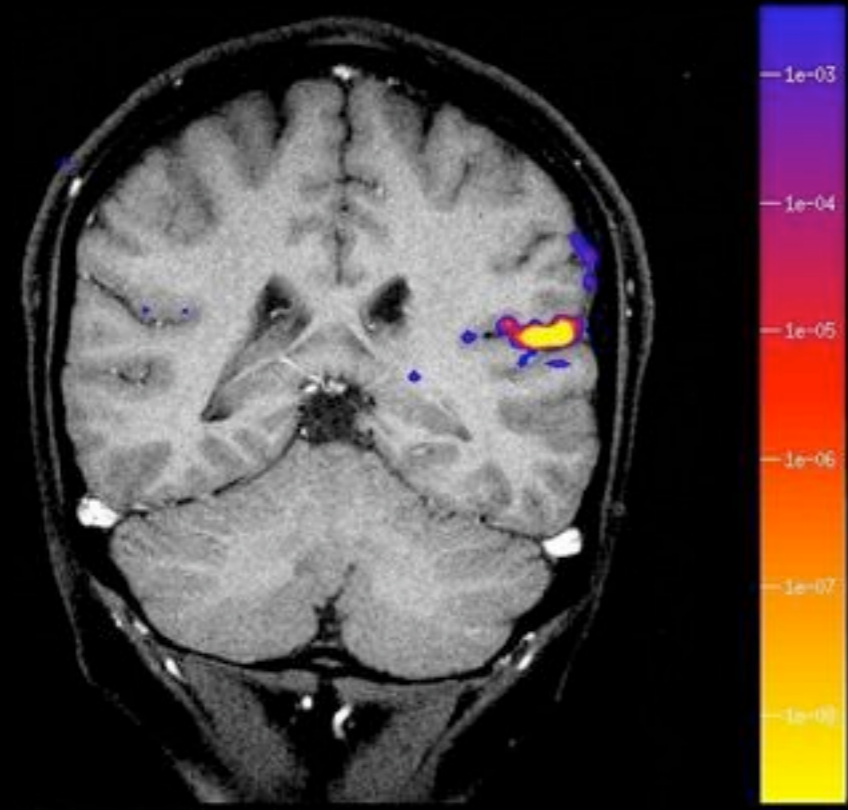


Pachet: machine performance



Atau Tanaka

EMG - muskelspenning





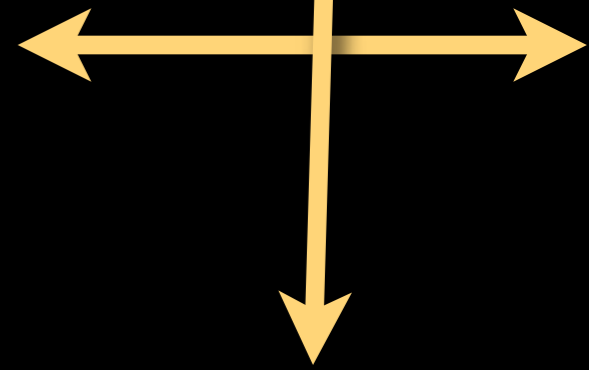
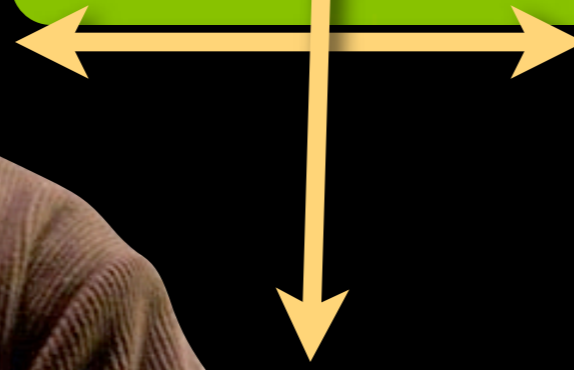
Toy Symphony

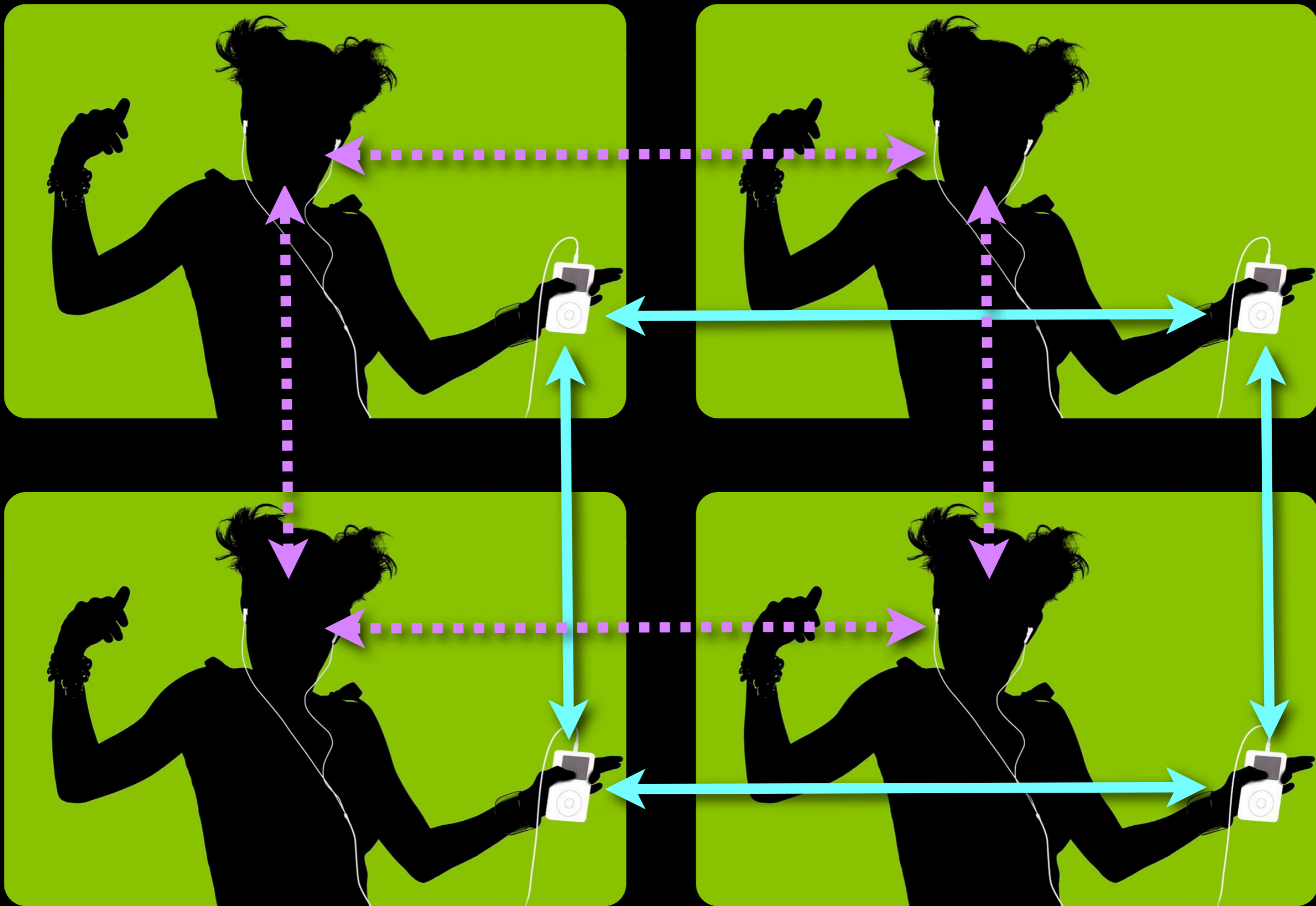
Aktiv musikk

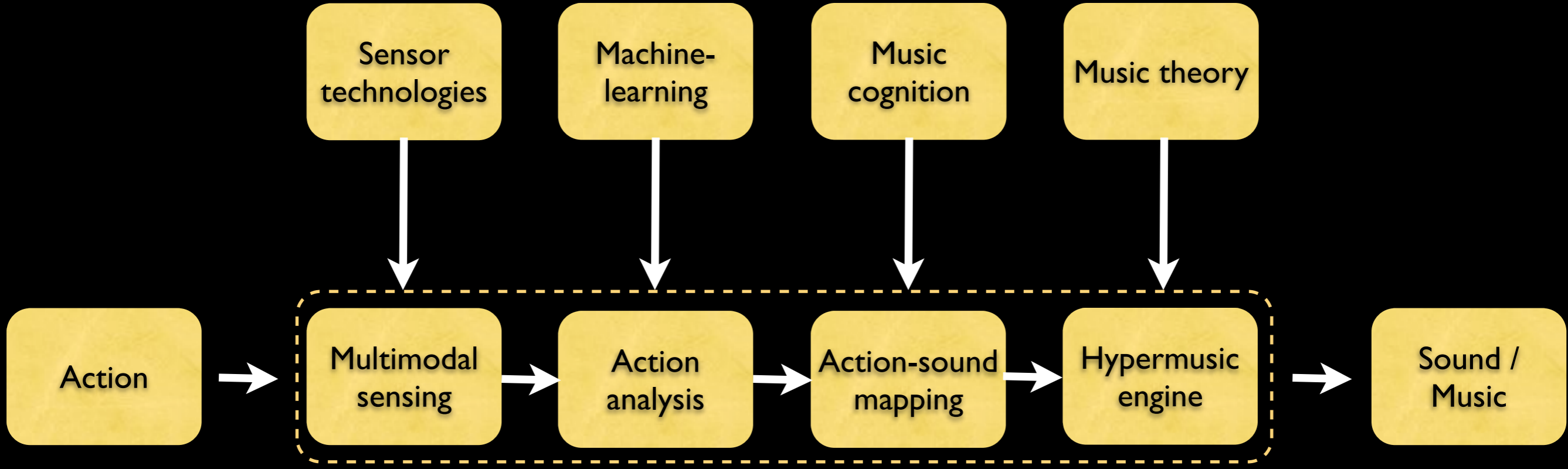
Aktiv musikk

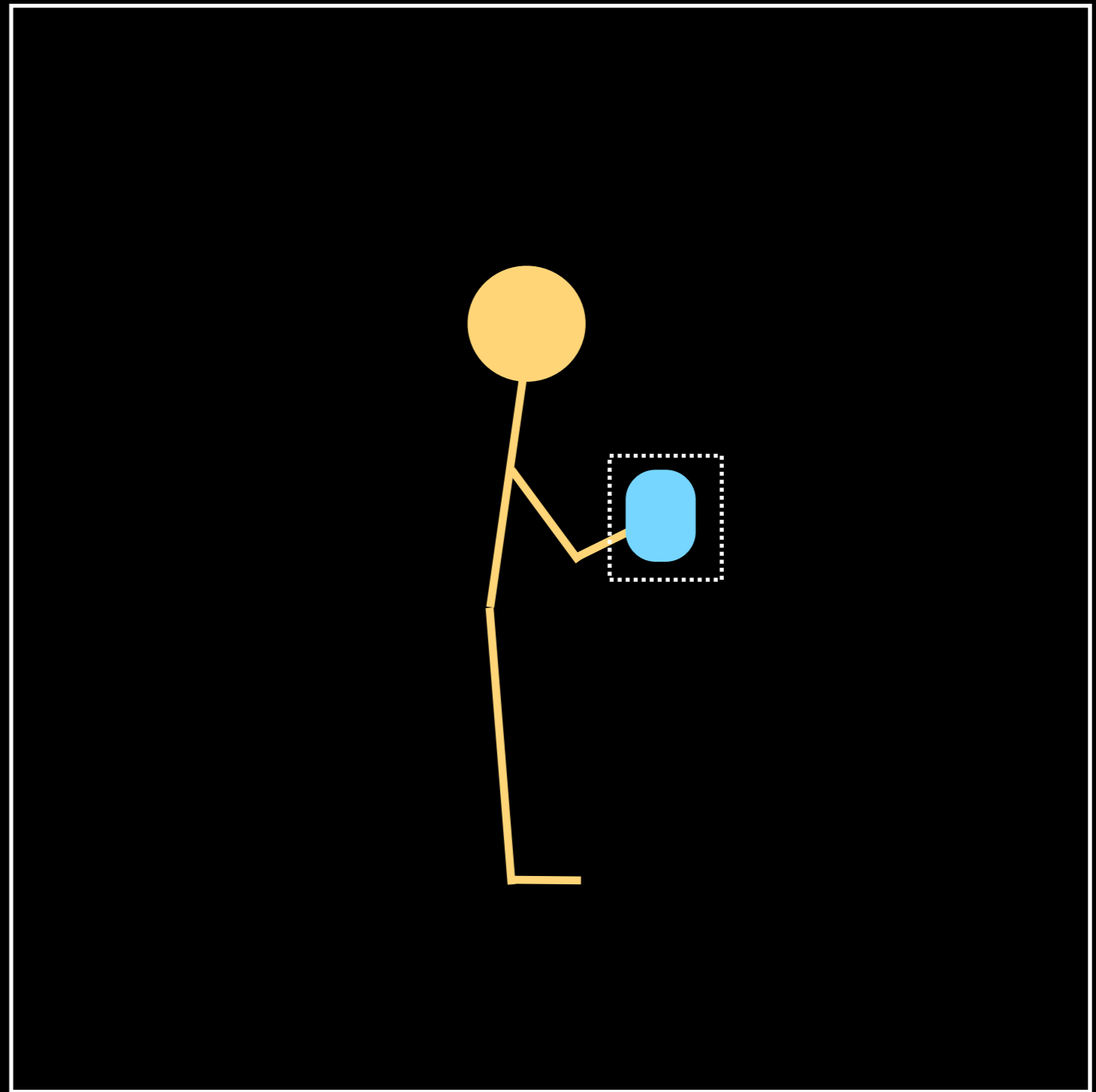
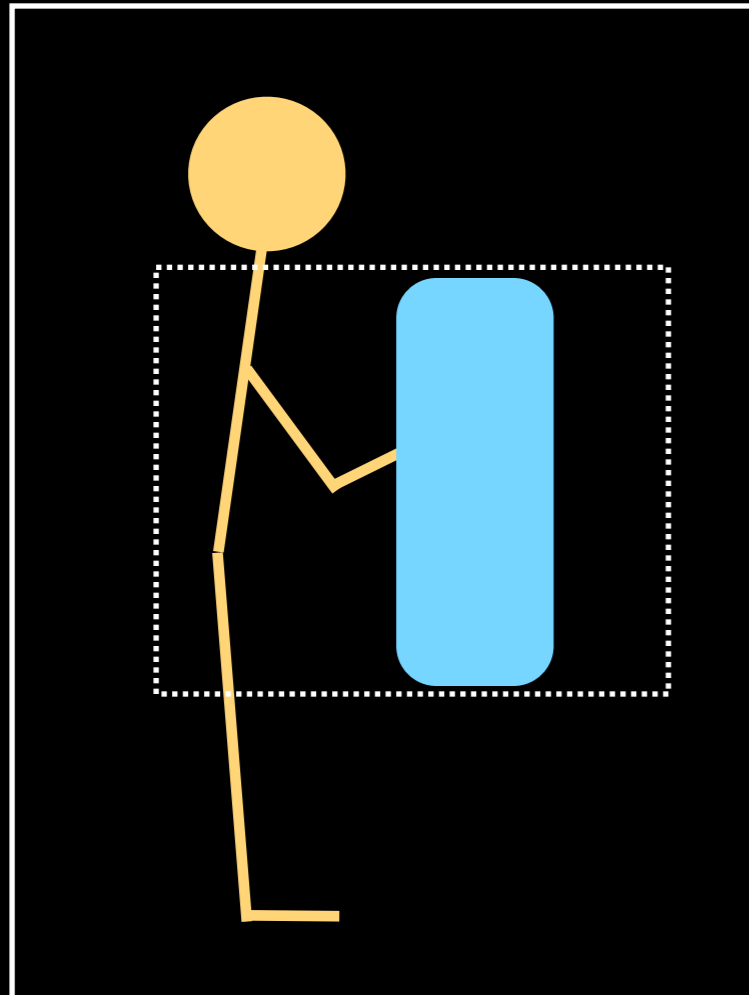


mimicking
sound-tracing
emotive









internal vs. external **movement space**



Relasjoner

Instrumentmaker

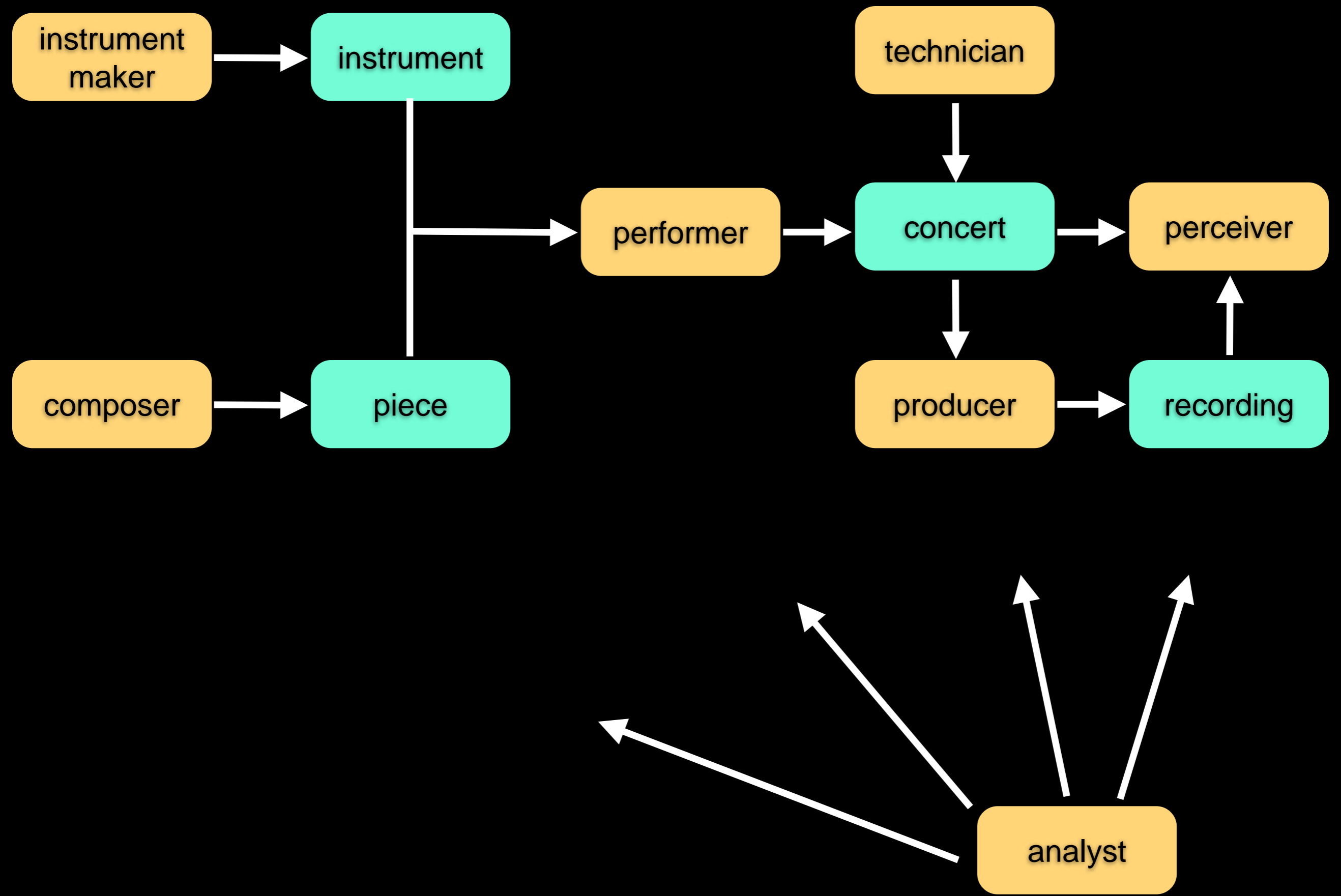
Instrument

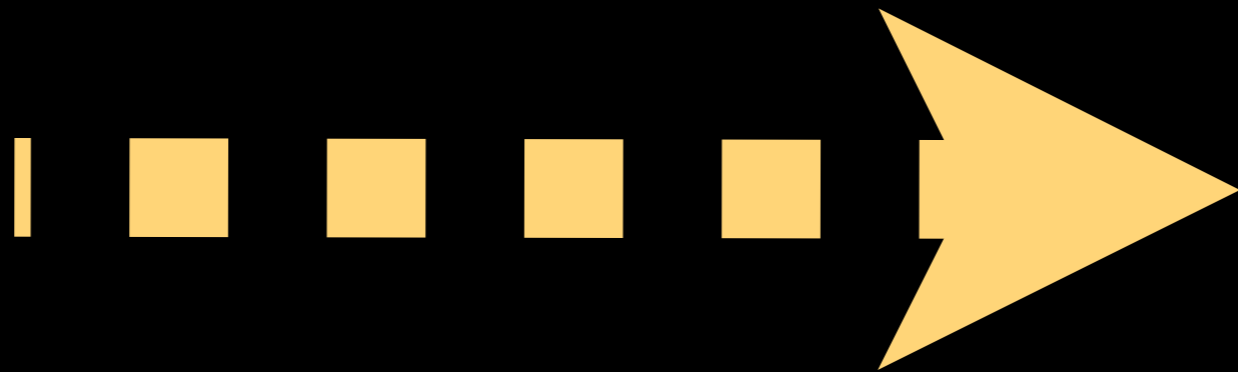
Komponist

Verk/stykke/låt

Utøver

Sanser







ICMC	International Computer Music Conference
NIME	New Interfaces for Musical Expression
CMMR	Computer Music Modelling and Retrieval
DAFx	Digital Audio Effects
ICAD	International Conference on Auditory Display
ISMIR	International Symposium on Music Information Retrieval
CIM	Conference on Interdisciplinary Musicology
SMC	Sound and Music Computing

Journal of New Music Research

Computer Music Journal

Organised Sound

Leonardo Music

Leonardo Art

IEEE ...

fourms.uio.no

Lydteori

Lydprogrammering

Musikk og bevegelse