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Žest ja muusika. Žest ja muusikaline vorm
Gesture and music. Gesture and musical form

Taju suunamine kui žest COSM mudeli näitel kaasaegse muusika analüüsimisel

The direction of perception as gesture: the COSM model as example for the analysis of contemporary music

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A single musical event can become a battleground for competing worldviews, methodologies, and social stances.

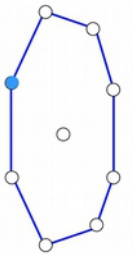
(Almén 2006: 1)

A single musical event can become a battleground for competing worldviews, methodologies, and social stances.

Music, thought a complex phenomenon, is often **stripped of its complexity** by the constraints of disciplinary boundaries and individual predispositions.

(Almén 2006: 1)

In memoriam Maris Valk-Falk (21.11.1934–19.5.2016)



COSM: Cognitive Octagonal Slice Model

Introduction

What

Method and cognitive model

Why

To analyse music by modeling what happens during the analyst's conscious perception of musical structures --> analyse **perceived musical tension**

Central phenomenon

Saliency of important features or aspects (more specifically events or parameters) of music in the process of auditory and visual perception and cognition

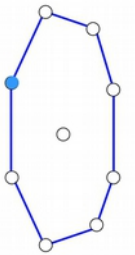
Main feature(s)

Impulse --> and its content: **musical aspects/parameters**

How to proceed

Three phases

Seven methodological/analytical steps



COSM: Cognitive Octagonal Slice Model

Definitions

Modeling – scientific modeling

Encyclopaedia Britannica, Rogers [2016]

- "the generation of a physical, conceptual, or mathematical representation of a real phenomenon that is difficult to observe directly."
- scientists constantly work to improve and refine models

Stanford Encyclopedia of Philosophy, Frigg and Hartmann (2012)

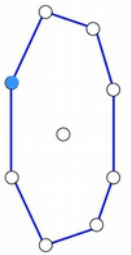
- representational function (what and how a model displays something under investigation)
- purpose (why such a modeling approach is chosen)

(1) represent of a selected part of the world (the 'target system')

  - **phenomena** or data models

(2) represent a theory in the sense that it interprets the laws and axioms of that theory

- "one of the principal instruments of modern science"
- "scientists spend a great deal of time building, testing, comparing and revising models"



COSM: Cognitive Octagonal Slice Model

Definitions

'Phenomenon' – "umbrella term covering all relatively stable and general features of the world"

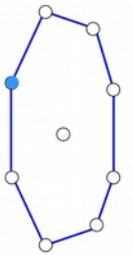
In COSM context:

- music as environment (Reybrouck 2015)
- musical events (Chouvel 2014, Lock 2010, Lock & Kotta 2012) as moments of changes
- Impulses "that are interesting from a scientific point of view"
- 'interesting' – saliency of chosen features / musical parameters
- idealized model (incl. distortions) or 'caricature model' (Frigg and Hartmann 2012)

Isolation of a small number of salient characteristics of a system

- music as environment
- saliency based on analogy in auditory and visual perception

Distort them into (more or less) "extreme case" – simplification of the function of chosen musical parameters as well as their treatment on a hypothetically equal level during the process of perception and conceptualizing.



COSM: Cognitive Octagonal Slice Model

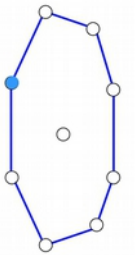
Definitions

Saliency, Saliency Oxford [2016]

- quality of being particularly noticeable or important
- Latin: ‘leaping’, a 'leap' means to jump or spring a long way, to a great height, or with great force; also to move quickly and suddenly
- „(of an angle) pointing outwards“
  - eight corners of the octagonal shape of COSM based on the analogy between visual and auditory perception processes

Similar concepts in music analysis/conceptualizing

- ‘cue abstraction’ (Deliege 2001)
- ‘act of focal attention’ or ‘act of mental pointing’ (Reybrouck 2010)



COSM: Cognitive Octagonal Slice Model

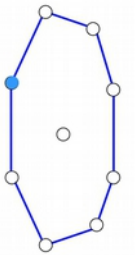
Definitions

Impulse – moment or event of change

- salient and in itself still complex feature
- mediating the comprehension of musical tension in relation to musical form (see Lock 2010a, b; Lock & Kotta 2012)
- kind of link between the music under observation (as real-world phenomenon) and the perception, cognition and conceptualizing process happening in the analyst's mind

Metaphorical level

- still frame of a film sequence – as a particular "frozen" moment in time
- drilling core known from geological research
  - makes visible and allows to analyze the existence, nature or content of a particular material, phenomenon or a related event in a defined and (based on other detecting methods) backdated time-moment and place (a kind of mapping) within a complex geological environment or (more generally) a complex structure



COSM: Cognitive Octagonal Slice Model

Definitions

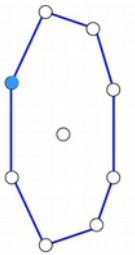
Impulse and **saliency** – idealizations, constraints and distortions

‘Aristotelian idealization’

- reduction (‘stripping away’) of aspects and feature **not necessarily important** in the moment of perception

‘Galilean idealization’

- distortions or simplifications
- „Galileo's approach to science to use simplifications of this sort whenever a situation was too complicated to tackle“ (Frigg & Hartmann 2012)



COSM: Cognitive Octagonal Slice Model

Object of analysis & modeling

Erkki-Sven Tüür (b. 1959)

Orchestral music – 4th Symphony / percussion concerto Magma (2002)

- transition in his personal style from the phenomena of strong contrasts towards the smooth transition between different states of the musical time and material (see Kotta 2008, Lock 2010)
- wave-like nature and culmination-dramaturgical structure

Aim of analysis & modeling

We focus on features or aspects ...

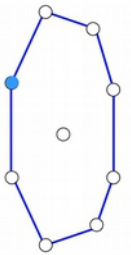
- **salient Impulses** as events or moments of change in the continuous flux of the sound (music as environment)

Hypothesis of analysis & modeling

... that influence the way one perceives and understands this music more universally

- what are triggers and 'content' of Impulses and their saliency

... how they support the comprehension of **perceived musical tension**



COSM: Cognitive Octagonal Slice Model

The COSM steps and levels | **Processes during modeling**

Prep-Phase: S
Phase I: A - R, C
Phase II: A&V - R
Phase III: R, C - R, C

S = segmentation
A = auditory perception
A&V = combined auditory with visual perception
R = representation
C = calculation

Preparation: segmentation of the object of analysis (**S**)

I: Perception phase - “unconscious modeling”

Perceptive listening process 1: detect Impulses (**A**)

Input data representation 1: record Impulses data (including standard timeline creation) (**R**, **C**)

II: Cognitive phase - “conscious modeling”

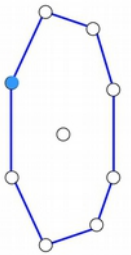
Cognitive listening process 2: detect parameters and their saliency using the COSM (octagonal slice model) (**A&V**)

Input data representation 2: record Impulse data from the 8-corner slice model (saliency values) (**R**)

III: Output data visualizing and analyzing phase

Output data representation preparation: values from the 8-corner slice model transfered to Excel (**R**, **C**)

Output data representation: visualization of 8-corner slice model data in XY Scatter diagram (**R**, **C**)



COSM: Cognitive Octagonal Slice Model

COSM – visualization of modeling process

Visualization of the modeling process: an adapted scheme combining Brodie's (1994) and Duit's (1991) schemes found in Khine & Saleh (2011: 3–4).

COSM (Cognitive Octogonal Slice Model) of salient musical features during the listener's/analyst's conscious perception of musical structures

Model

Model (R_m)

musical tension

Analog (R_1)

Target

"something we want to understand:"

Transfer of features

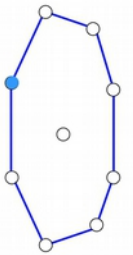
Analogy (A)

Intuitively perceived/understood **wave-like character** of contemporary orchestral music by Erkki-Sven Tüür (*1959)

Target (R_2)

Source

"something known to us from our everyday life or prior experiences"



COSM: Cognitive Octagonal Slice Model

COSM – visualization of modeling process

Levels of the process of modeling

A. General/overal/global aim

a) **analyse music as environment** using auditory and visual perception-based cognitive approaches;

B. Process

b) what happens during the **listener's/analyst's conscious perception of musical structures;**

C. Specific/local aim

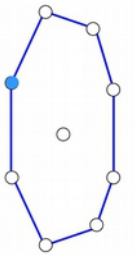
c) **perceived musical tension in contemporary orchestral music;**

D1. Specific/local sub-level 1

d1) **Impulses as moments of change** in the continous flux of the sound;

D2. Specific/local sub-level 2

d2) **"content" (musical aspects, music theoretical parameters) of Impulses** according to their **saliency** based on auditory and visual perception analogy using virtual 3D visualization/representation principles.

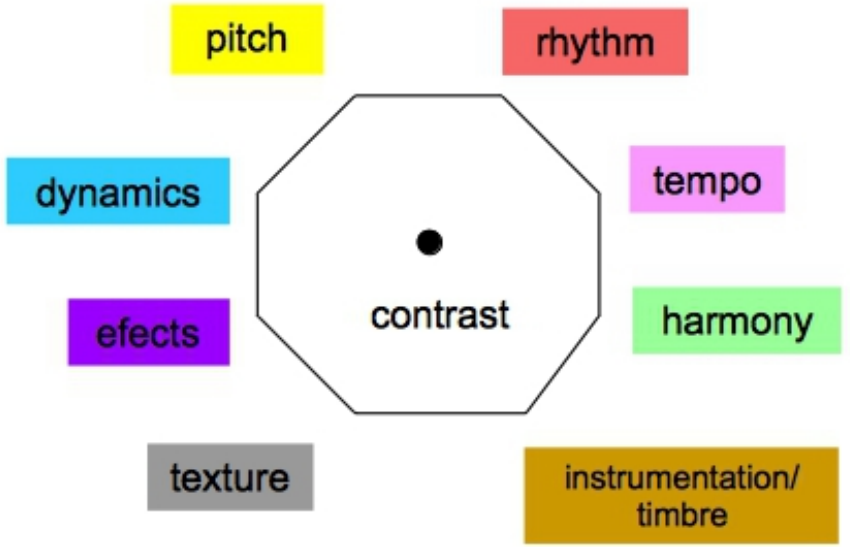


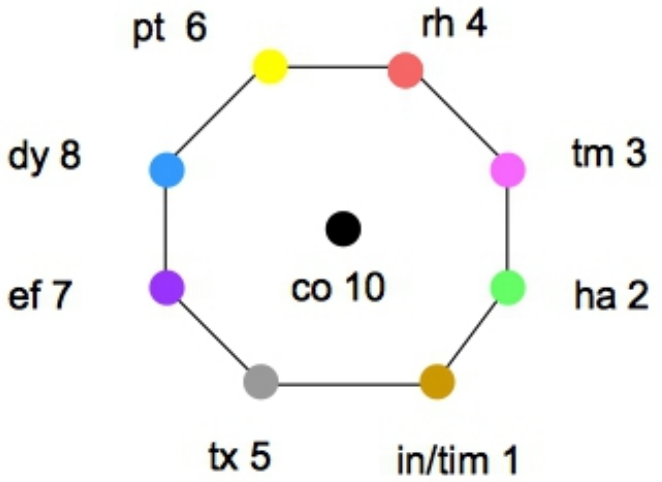
COSM: Cognitive Octagonal Slice Model

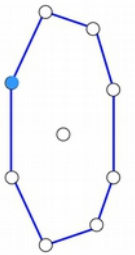
The COSM shape, its elements and functioning

Basic shape of COSM – octagonal (eight corner) geometric 2D figure.

Musical parameters adapted from Kirschbaum (2001).



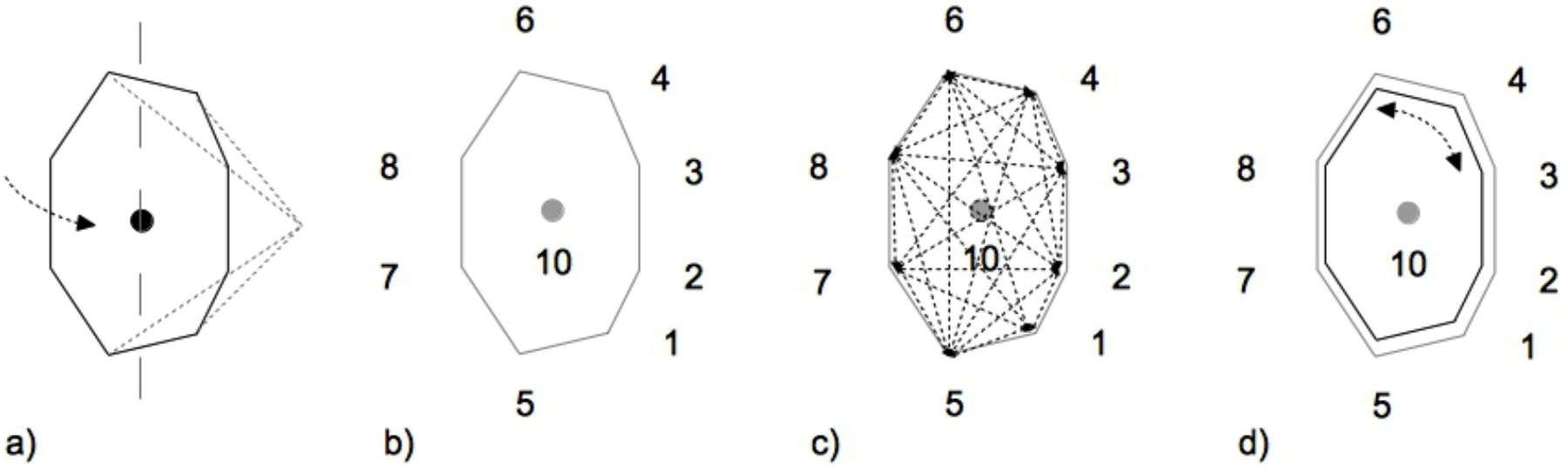


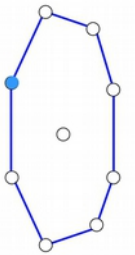


COSM: Cognitive Octagonal Slice Model

The COSM shape, its elements and functioning

The COSM 3D shape and the rotating principle.

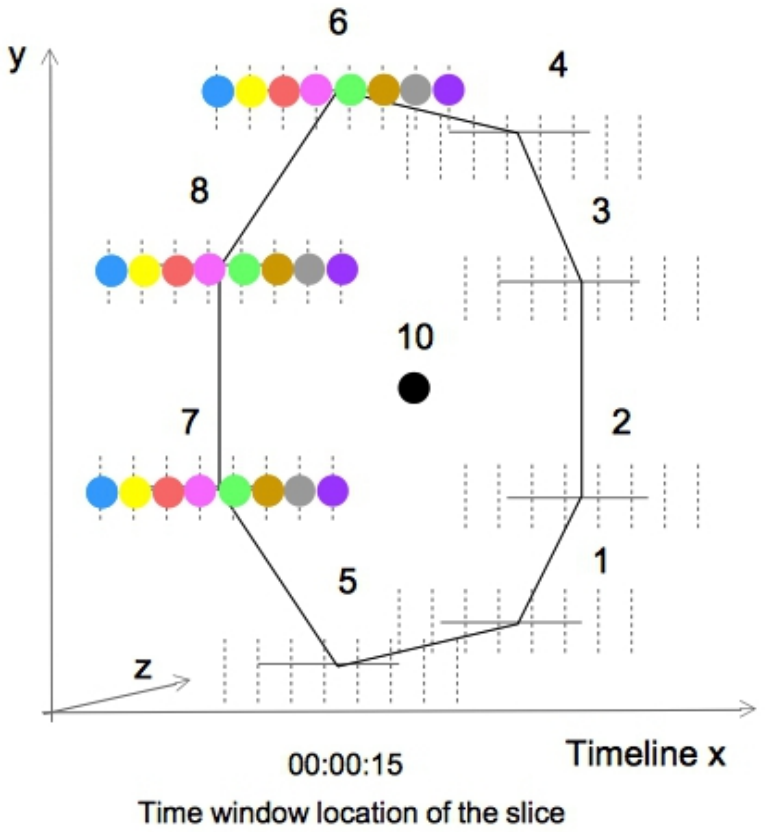




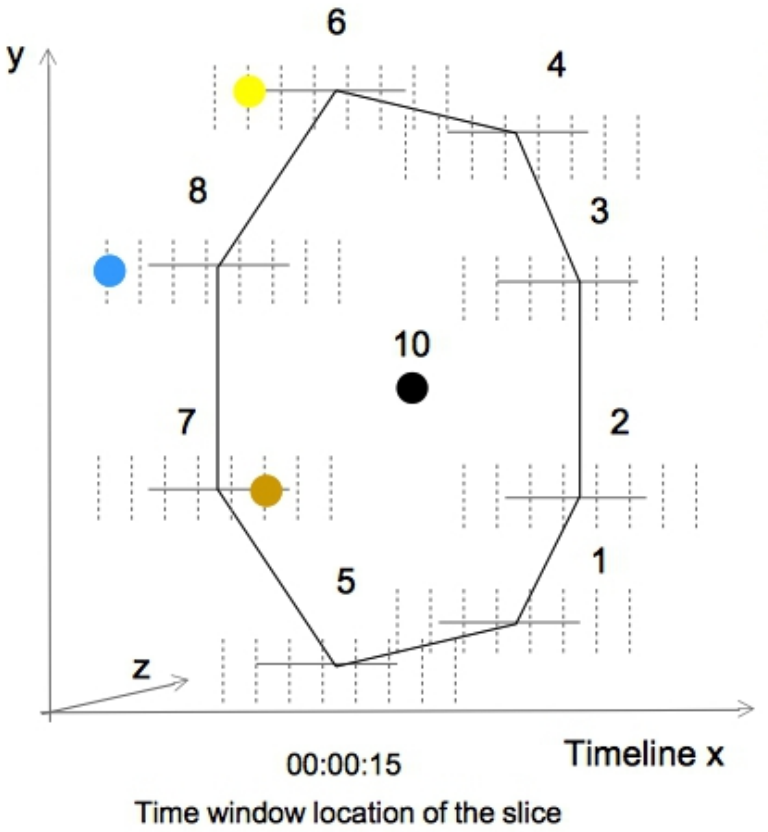
COSM: Cognitive Octagonal Slice Model

The COSM shape, its elements and functioning

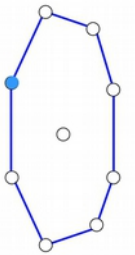
The COSM 3D shape as Impulse slice in a particular time window location.



Time window location of the slice



Time window location of the slice

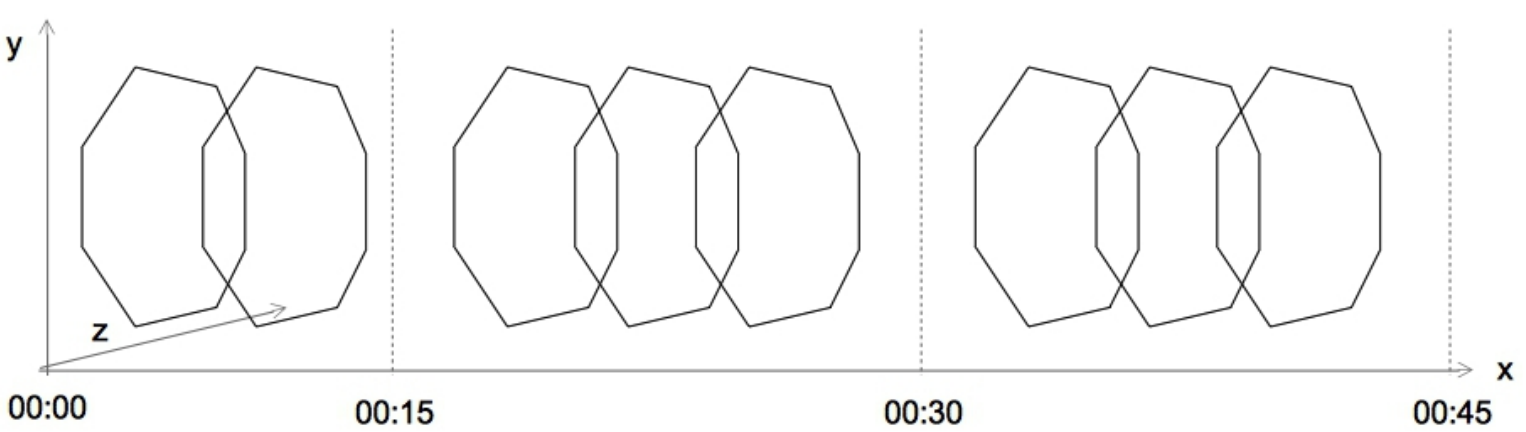


COSM: Cognitive Octagonal Slice Model

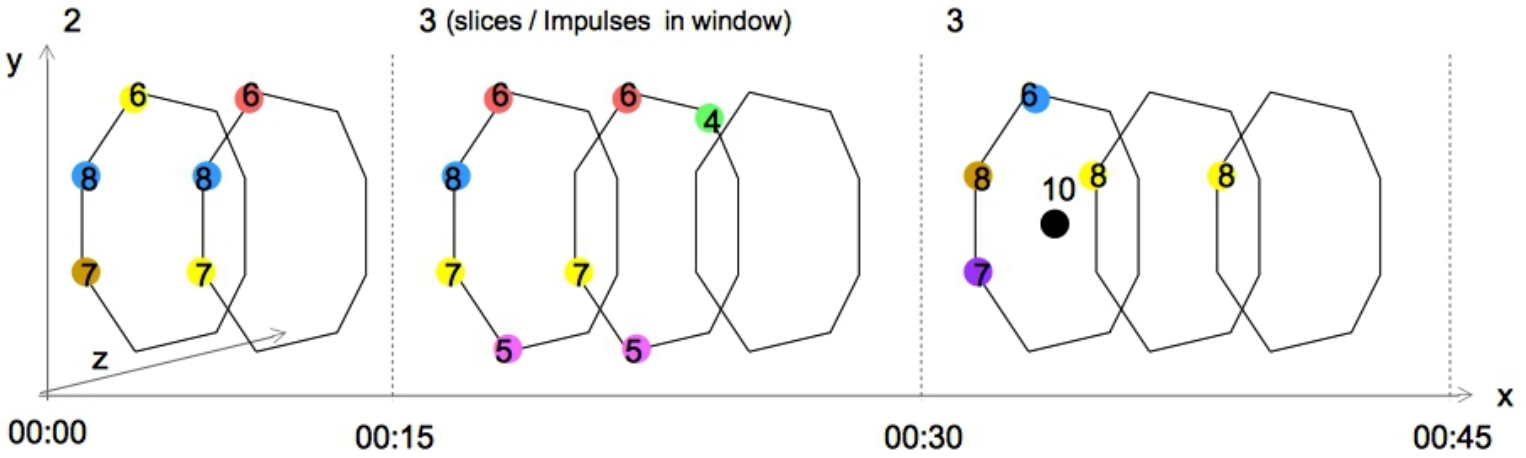
The COSM shape, its elements and functioning

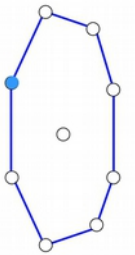
The functioning of COSM as consecutive slices / Impulses in time-lined 15 seconds time windows.

Slices / Impulses consecutively ordered / graphically depicted within 15 second windows.



Assigned fictive parameters at the corners of each slice / Impulse.



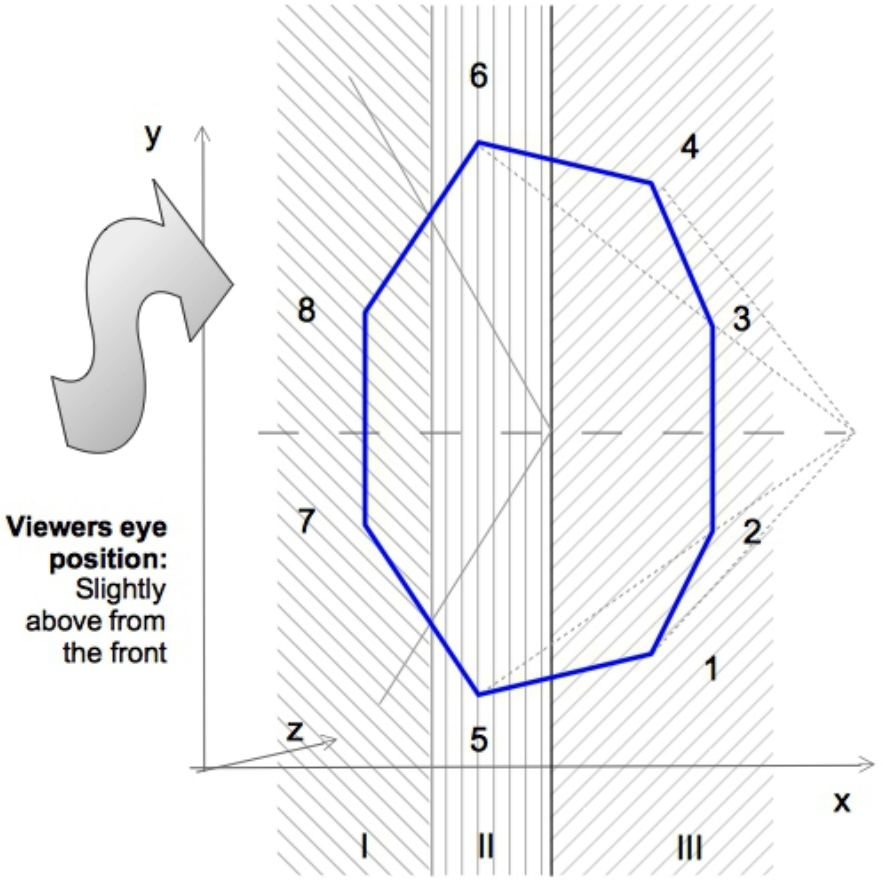


COSM: Cognitive Octagonal Slice Model

The COSM shape, its elements and functioning

The COSM saliency visual principles.

Visual principles of defining the values to the corners of COSM (based on Gestalt principles)



Viewers eye position: Slightly above from the front

Basic gestalt principles in relation to scene analysis (Wang 2007):

- proximity
- similarity
- common fate (or motion)
- good continuity
- connectedness and common region
- familarity

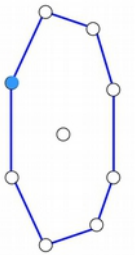
Central perspective "escape point"

Areas of the model

I foreground area
- catched by eye first

II middleground area
- catched by eye next

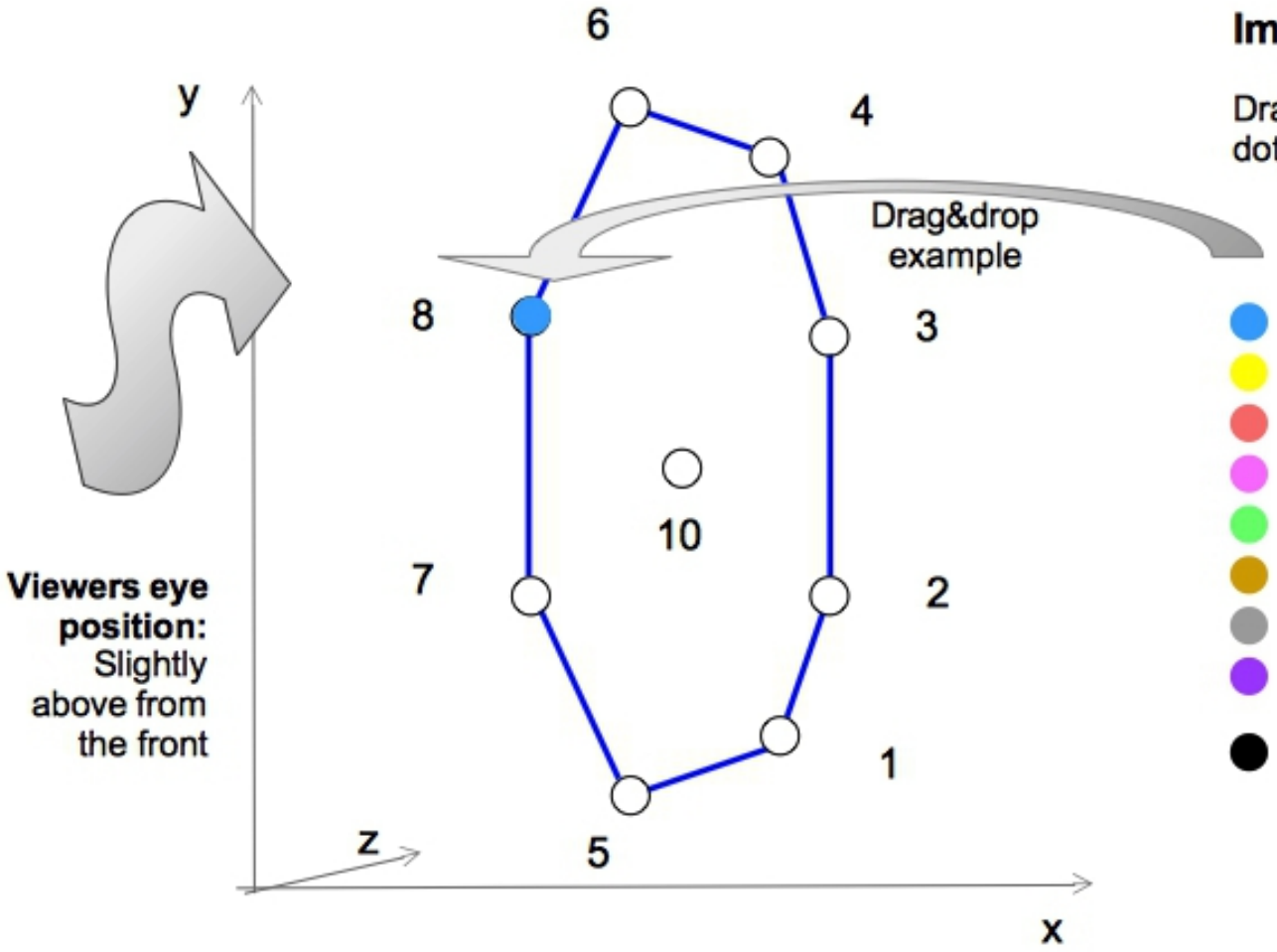
III background area
- catched by eye last



COSM: Cognitive Octagonal Slice Model

The COSM shape, its elements and functioning

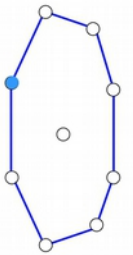
The COSM parameter positioning principle.



Im-Cont parameters menu

Drag&drop the appropriate parameter dot to the chosen corner of the COSM.

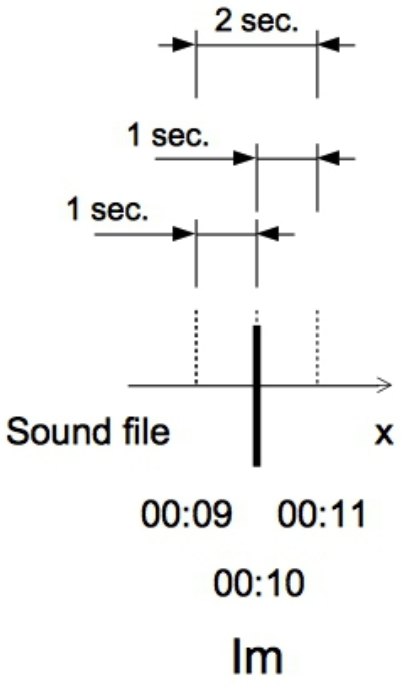
- dynamics
- pitch
- rhythm
- tempo
- harmony
- Instrumentation/timbre
- texture
- effects
- contrast



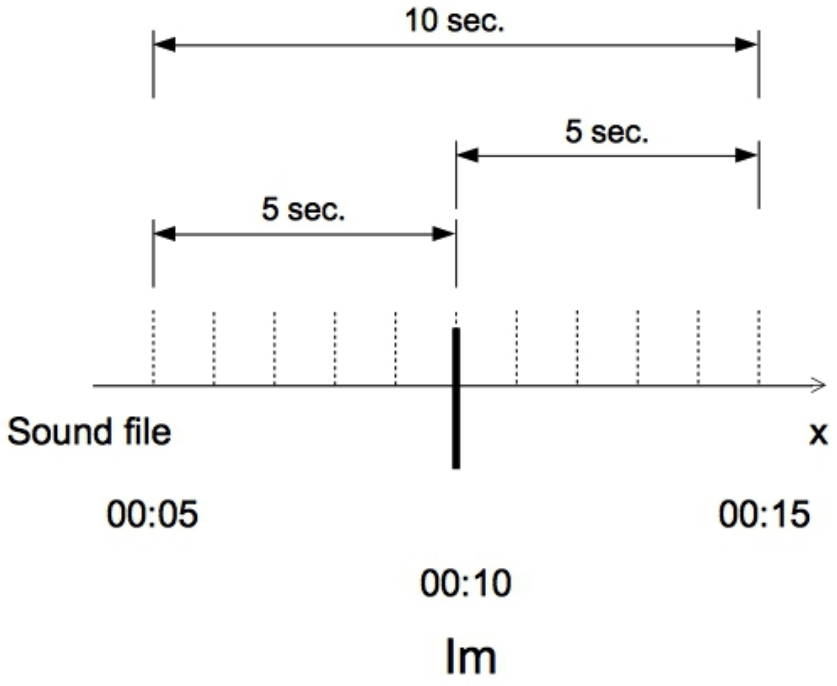
COSM: Cognitive Octagonal Slice Model

The COSM shape, its elements and functioning

Cognitive listening process: detect Im-Cont parameters and their saliency using the COSM.

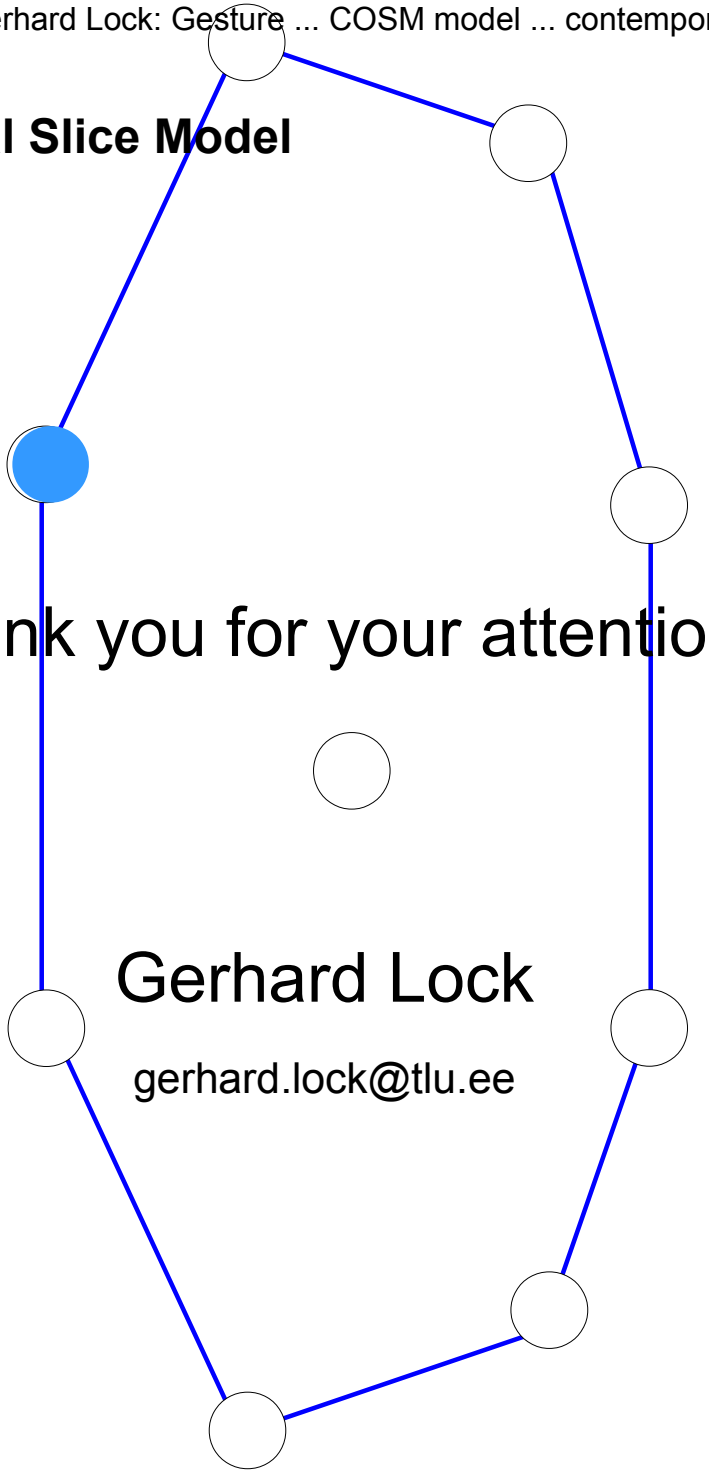


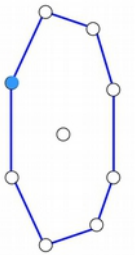
a) min. analytical Im time frame (moving window)



b) max. analytical Im time frame (moving window)

COSM: Cognitive Octagonal Slice Model





Thank you for your attention!

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