

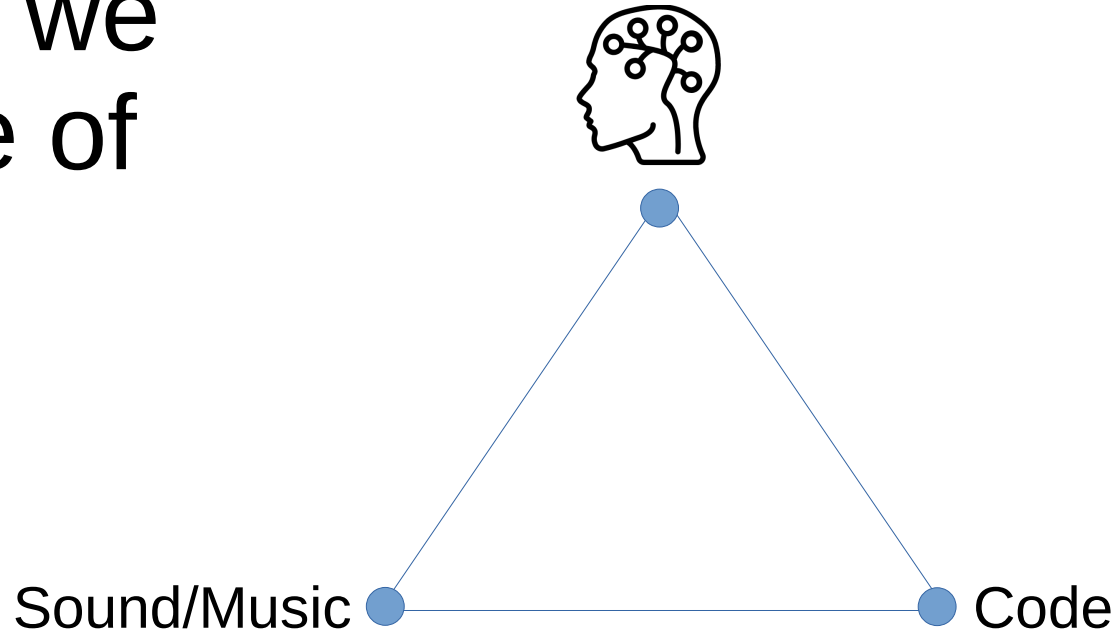
The Analysis of Computer Music Works with the Help of Code: Six specific features of the code to consider

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General question

How in musical analysis can we use the code of computer music ?



Towards a response :

6 specific features of the code to consider



1.

A new level of information

Clair de Lune

from "Suite Bergamasque" L. 75

Claude Debussy
(1862–1918)

3rd Movement

Andante très expressif

Piano



« partition exhaustive »

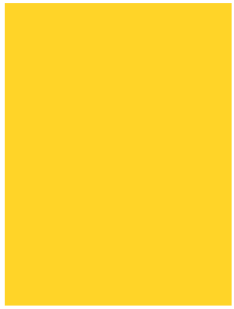
« partition intégrale »

FILED AT/4 FORTRAN P1 CAMBRIDGE MONITDR SYSTEM

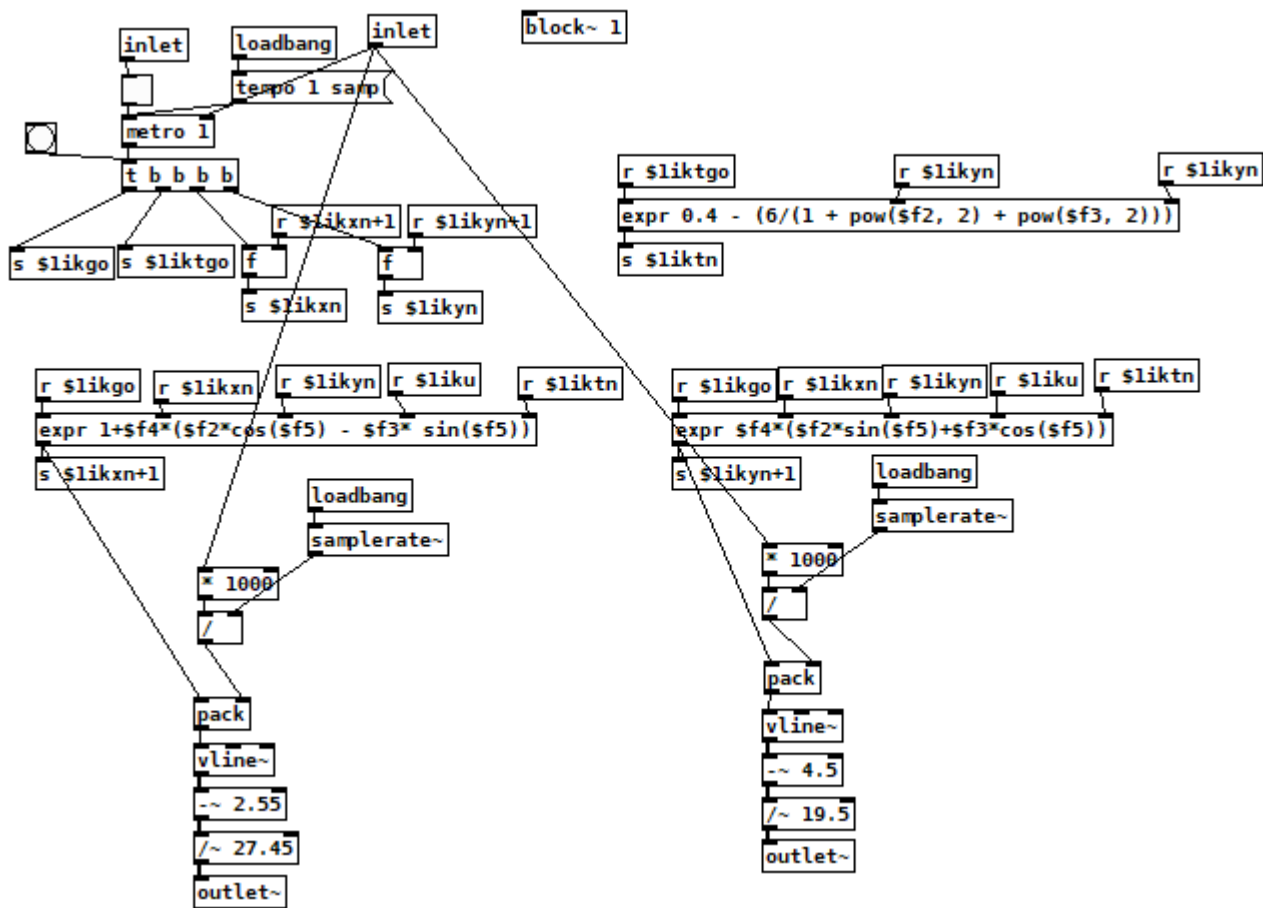
```
C TWO VOICES RANDOM MUSIC AT/00010
DIMENSION NP(8),KTT(1000) AT/00020
K=0 AT/00030
KONT=1 AT/00040
WRITE(6,1) AT/00050
1 FORMAT(1X,'BATTI 8 CIFRE') AT/00060
READ(5,3)N1,N2 AT/00070
3 FORMAT(2I4) AT/00080
1000 N2=N2+23 AT/00090
N1=(N1*23)+(N2/10000) AT/00100
N2=IABS(MOD(N2,10000)-(N1/10000)) AT/00110
IF(N2.LE.0)N2=KONT AT/00120
N1=MOD(N1,10000) AT/00130
IF(N1.LE.0)N1=KONT AT/00140
L=0 AT/00150
NX=N1 AT/00160
GO TO 9 AT/00170
8 NX=N2 AT/00180
9 DO 10 I=1,4 AT/00190
L=L+1 AT/00200
KD=10**(4-I+1) AT/00210
NX=MOD(NX,KD) AT/00220
10 NP(L)=NX/(KD/10) AT/00230
IF(L.NE.8)GO TO 8 AT/00240
IF(K.EQ.1)GO TO 52 AT/00250
KFR1=NP(1)*10+NP(2) AT/00260
15 IF(KFR1.LE.35)GO TO 20 AT/00270
KFR1=KFR1-36 AT/00280
GO TO 15 AT/00290
20 KOT1=NP(3) AT/00300
25 IF(KOT1.LE.7)GO TO 30 AT/00310
KOT1=KOT1-8 AT/00320
GO TO 25 AT/00330
30 INT1=NP(4)*10+NP(5) AT/00340
35 IF(INT1.LE.15)GO TO 40 AT/00350
INT1=INT1-16 AT/00360
GO TO 35 AT/00370
40 KT1=NP(6)*10+NP(7) AT/00380
45 IF(KT1.LE.31)GO TO 50 AT/00390
KT1=KT1-31 AT/00400
GO TO 45 AT/00410
50 KKFR1=KFR1*(2**20) AT/00420
KKOT1=KOT1*(2**17) AT/00430
KINT1=INT1*(2**13) AT/00440
IF(K.EQ.2)GO TO 91 AT/00450
52 KFR2=NP(8)*10+NP(1) AT/00460
55 IF(KFR2.LE.35)GO TO 60 AT/00470
KFR2=KFR2-36 AT/00480
GO TO 55 AT/00490
60 KOT2=NP(2) AT/00500
65 IF(KOT2.LE.7)GO TO 70 AT/00510
KOT2=KOT2-8 AT/00520
GO TO 65 AT/00530
70 INT2=NP(3)*10+NP(4) AT/00540
75 IF(INT2.LE.15)GO TO 80 AT/00550
```

Handwritten notes:
50 NTL = KT1
50 NTL = KT1

github.com/Unipisa/TAUmus-Depository/blob/master/raw_materials/Generazione_disposizioni.pdf

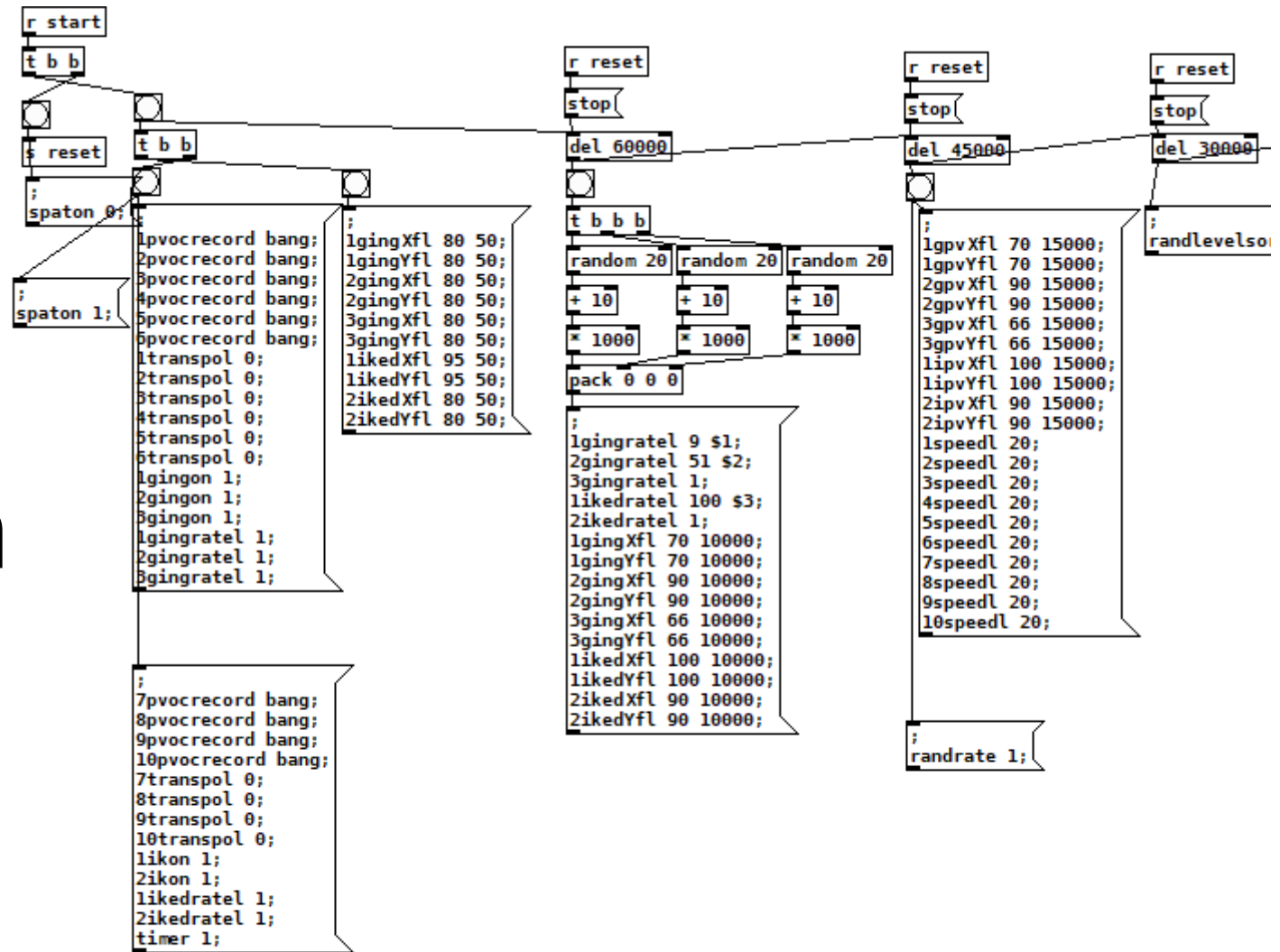


2. Knowledge

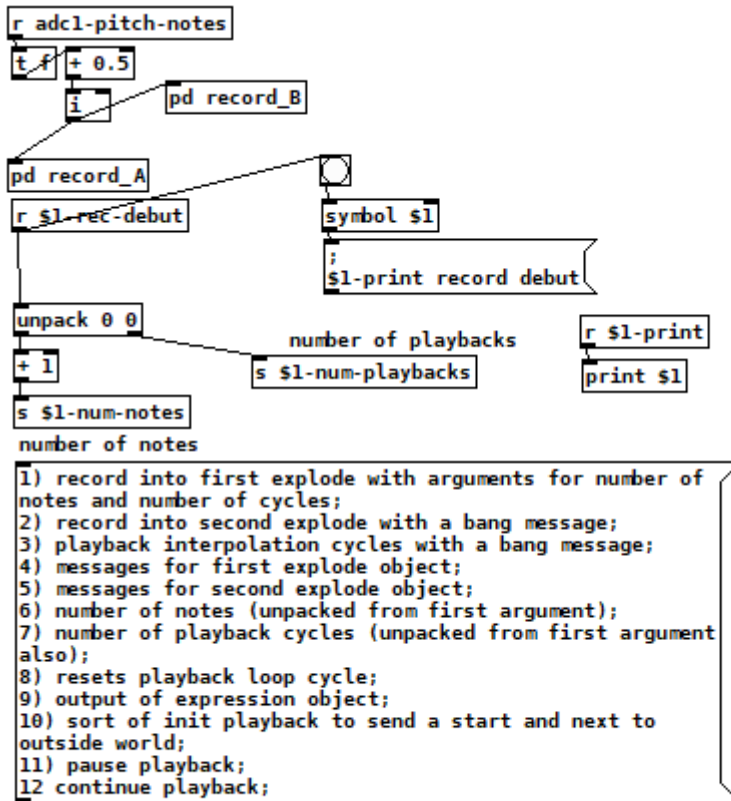


Sound synthesis / processing

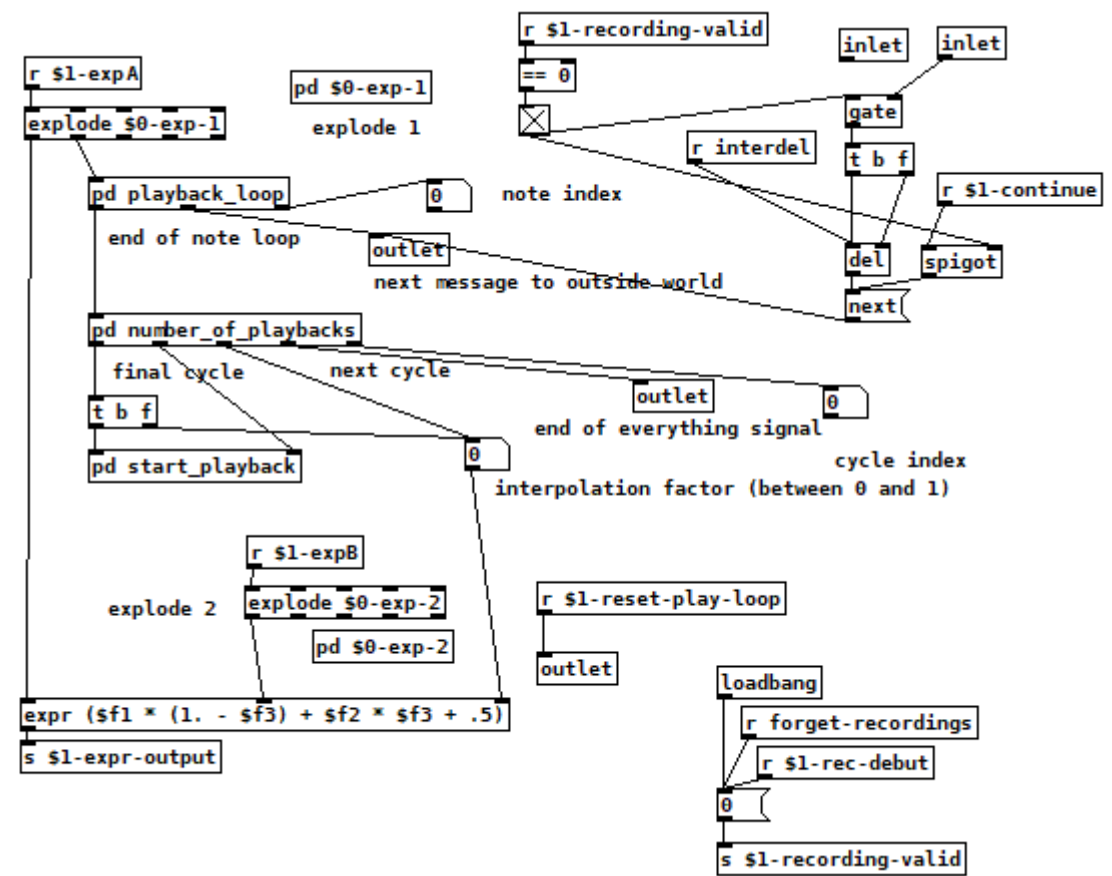
Temporal organisation



Jupiter (1987) P. Manoury, M. Puckette : interpolation



- 1) record into first explode with arguments for number of notes and number of cycles;
- 2) record into second explode with a bang message;
- 3) playback interpolation cycles with a bang message;
- 4) messages for first explode object;
- 5) messages for second explode object;
- 6) number of notes (unpacked from first argument);
- 7) number of playback cycles (unpacked from first argument also);
- 8) resets playback loop cycle;
- 9) output of expression object;
- 10) sort of init playback to send a start and next to outside world;
- 11) pause playback;
- 12) continue playback;



Programmation



3.

Code : syntaxe

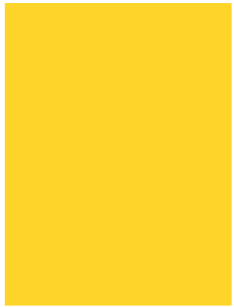
```
//-----`wind`-----  
// A very simple wind simulator, based on a filtered white noise  
//  
// #### Usage  
//  
// ~~~  
// wind(f) : _  
// ~~~  
//  
// Where:  
//  
// * `f` : is the force of the wind: between 0 and 1  
//  
//-----  
  
import("stdfaust.lib");  
  
wind(force) = no.multinoise(2) : par(i, 2, ve.moog_vcf_2bn(force,freq)) : par(i, 2, *(force))  
  with {  
    | freq = (force*87)+1 : ba.pianokey2hz;  
  };  
  
process = wind ( hslider("v:wind/force",0.66,0,1,0.01) : si.smooth (0.997) );
```

faustide.grame.fr/



Results (i)

- The code is not directly related to a musical level
code as material is not musical (Magnusson 2009)
- To operate in musical levels, one have to operate in computational levels
- Computational representations



4. Design

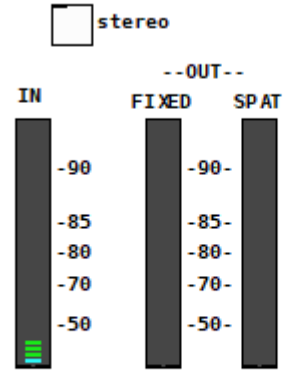
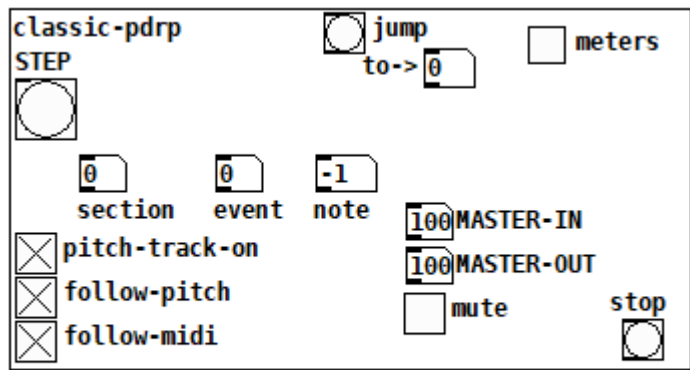
*Design is the interaction
between understanding and creation*
(Winograd and Flores 1994)

Sound
music
computing

design

Musical
ideas

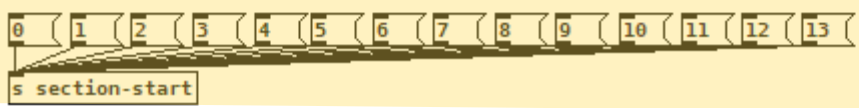
Programming
skill



- pd noise
- pd reverb
- pd harm4
- pd fshift
- pd samp-oscs
- pd pafs1-4
- pd pafs5-8
- pd spatial
- pd HidiMix
- pd MASTER
- pd reset
- pd interpol
- pd misc
- pd misc2
- pd data-entry
- pd puf-ctl
- pd grand-central

- pd tables
- pd bizarreries
- pd test-follower
- pd more-follower-stuff
- pd f9-parameters

- pd vu-cf-bw
- pd evt-sec2
- pd evt-sec3
- pd spatupdown
- pd RANDGODOWN
- pd test
- pd moretest
- pd niveaux-IN-OUT
- pd writesf
- pd readsf
- testtone 0.03 69
- testtone 0.03 61
- testtone 0
- ; section-scofo print
- ; interdel stop
- ; forget-recordings bang



Common Knowledge



5.
Abstraction : Architecture

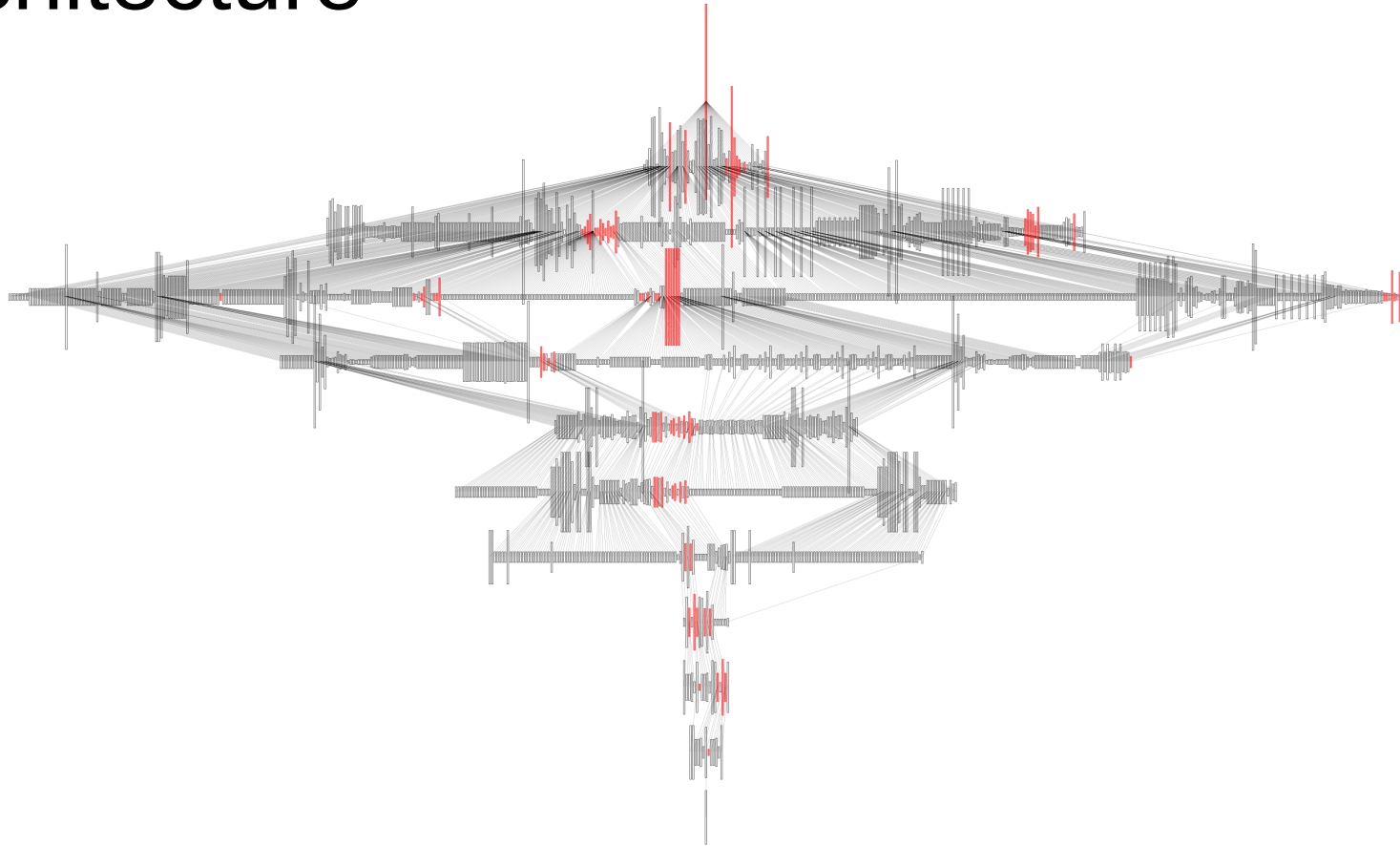
Hosting higher-
level meanings

Separating the
essential from
the detailed

Abstraction

Abstracting from too much
information

Architecture



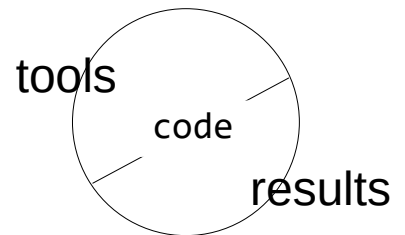
(Dufeu 2013)

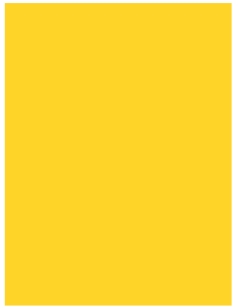
Partita I (2006) P. Manoury



Results (ii)

- The structure of the code does not reflect that of the work
- One architecture per designer
- Only the desire to organisation will governs the structure of the code (≠ publishing score)





6. Semantic

The NOT statements specify an amplitude (P5) and frequency (P6): the [bell] structure will be transposed into amplitude and frequency according to these parameters

Lorrain 1980

Variable name	Meaning
[1-10]speedl	changes the speed of incoming signal (stretching)
[1-3]gpvXfl	changes the amplitude of the X signal from one Gingerbreadman voices
[1-3]gpvYfl	changes the amplitude of the Y signal from one Gingerbreadman voices
[1-2]ikedXfl	changes the amplitude of the X signal from one Ikeda voices
[1-2]ikedYfl	changes the amplitude of the Y signal from one Ikeda voices
randlevelspvoc	activate random detunes algorithm
decreasedetune	activate a sequence to continuously reduce detunes range

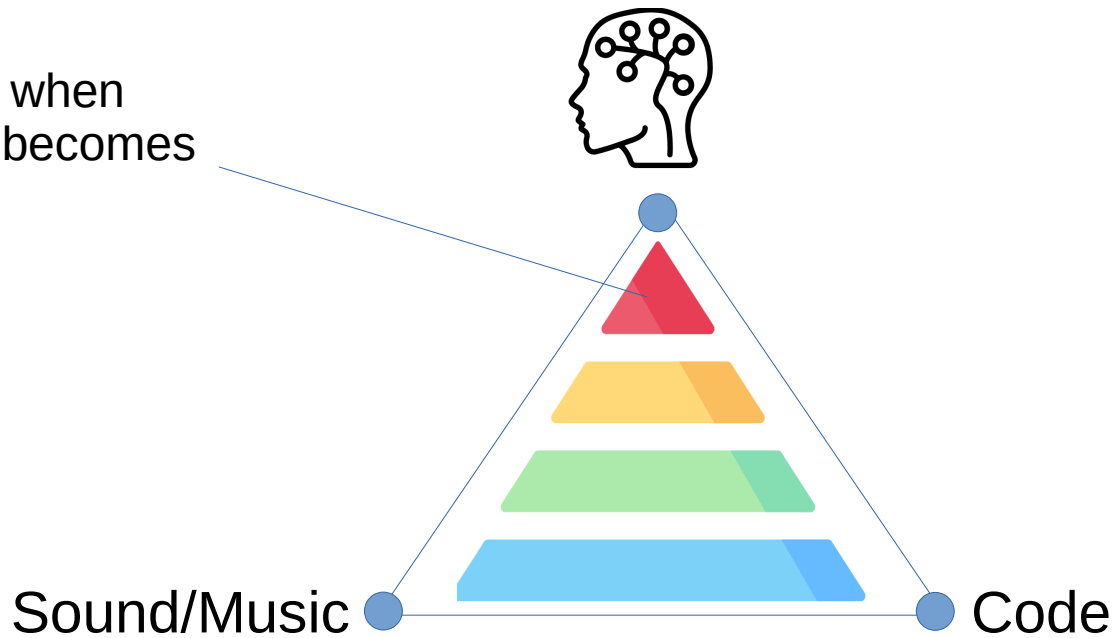
Tab 2, table of the Chaotic Module controls

(Larrieu 2021)

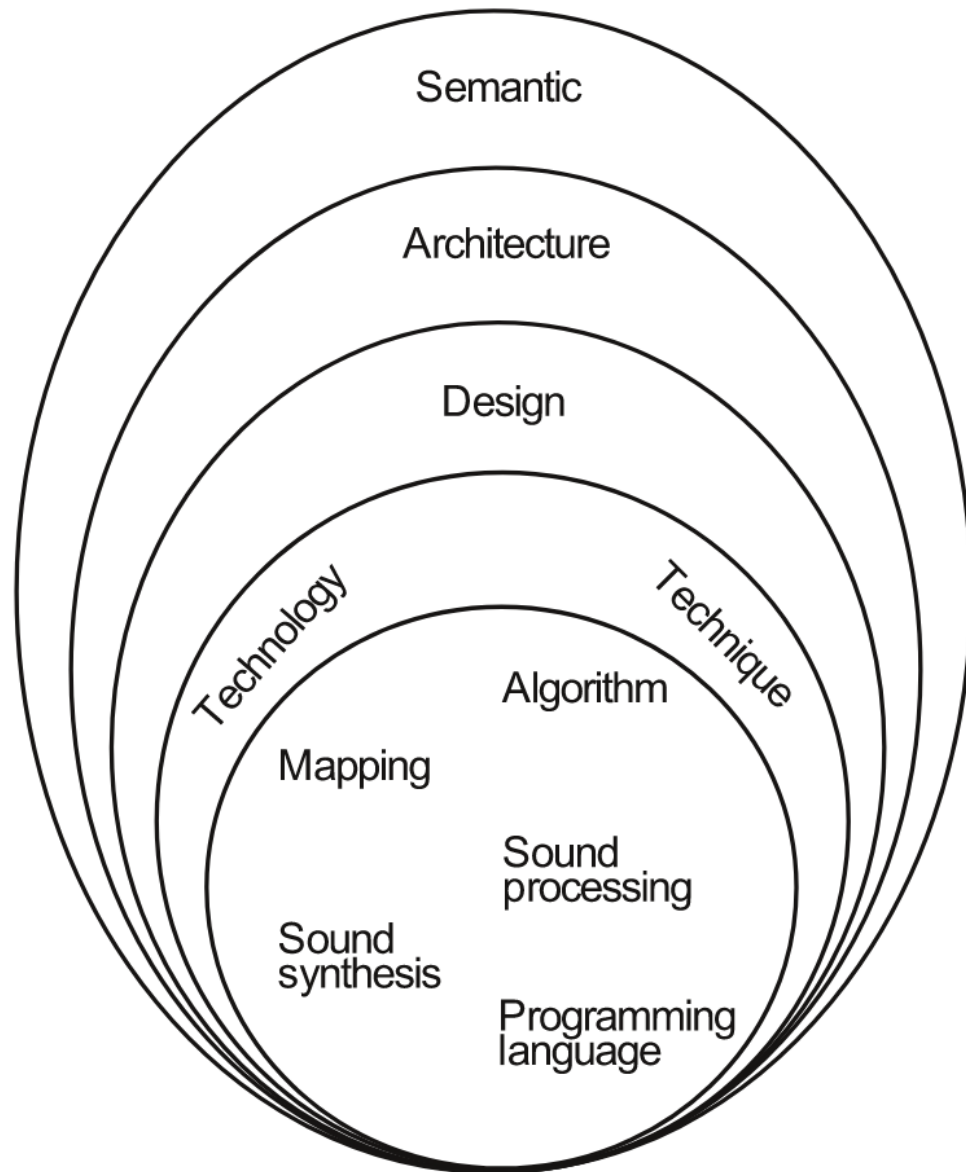
After all it will be always the semantic one associates to a given stream and processing module which counts.

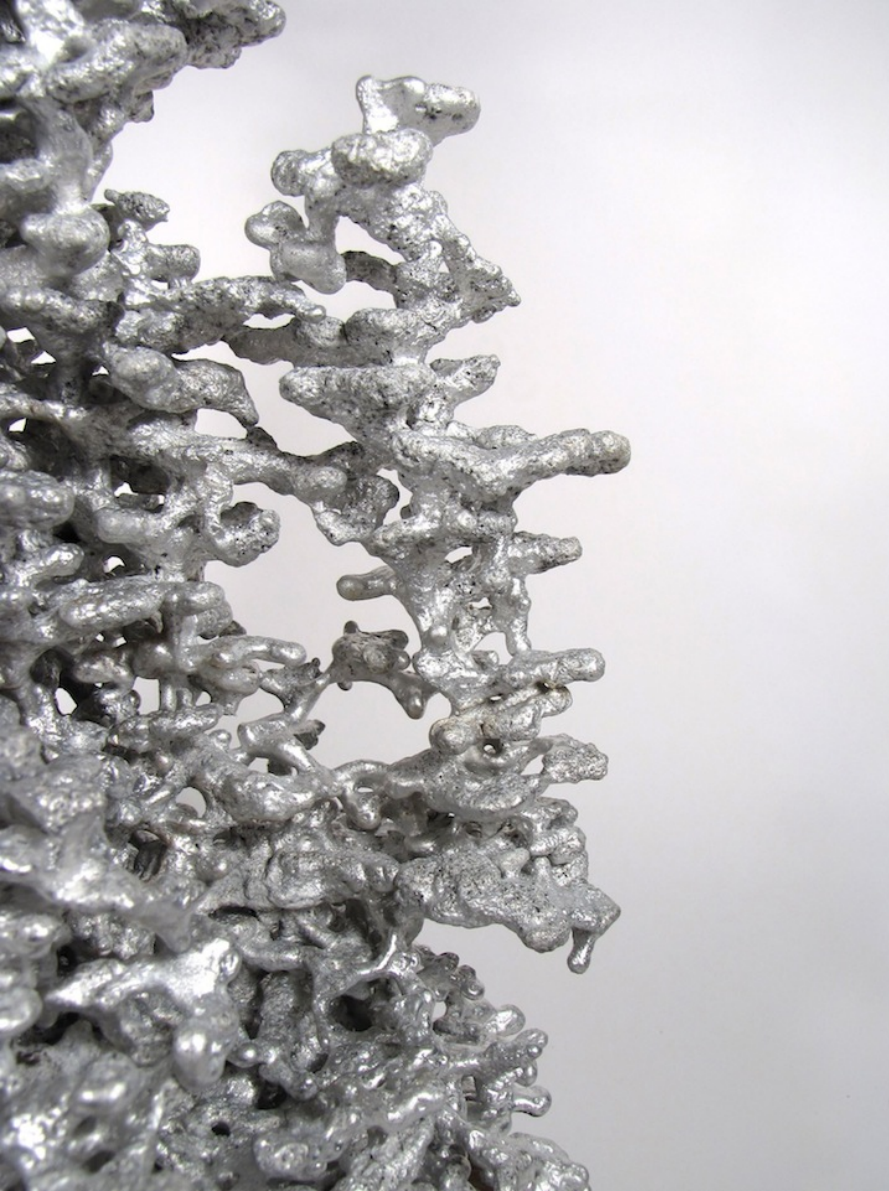
(Schnell, Battier 2002)

Semantic: when
the code “becomes
musical”



Organisation
of the
different
aspects of
the code





Thank you