

CONSERVATORIO ROSSINI





ALMA MATER STUDIORUM Università di Bologna





FONDS NATIONAL SUISSE DE LA RECHERCHE SCIENTIFIQUE

# CARMINE-EMANUELE CELLA

# **DOES ORCHESTRATION REALLY EXIST?**

**IRCAM JUNE 2018 - A PERSPECTIVE ON (ASSISTED) ORCHESTRATION** 

### PART 1: ON ORCHESTRATION

ON ORCHESTRATION 1/5

#### **A PERSONAL PERSPECTIVE**

Inner-connections (as the piano resonance pedal)

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Not a single interpretation of this concept

**ON ORCHESTRATION 2/5** 

#### **IS MUSIC LIKE THE SEA?**



## IS MUSIC LIKE THE SEA?

#### Composing with sounds



# **IS MUSIC LIKE THE SEA?**

#### Composing with sounds

Symbolic space, algebra of quantities

#### **Composing** within sound

Signal space, analysis of qualities

State States

# **IS MUSIC LIKE THE SEA?**



*inner space*: is defined from the relations between the partials and can be roughly regarded as timbre;

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*outer space*: is defined by the relations between different acoustical entities and can be roughly regarded form;

**projective space**: is defined by the relations between the whole acoustic experience and the place where it happens.

#### **ORCHESTRATION AS TOPOS (PLACE)**

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Composers find a position in this topology: some write more *with* sounds, others write more *within* sound.

# This changes the way each one think about orchestration.

# THE OPEN PROBLEM

# Which connections can we make between the symbolic space and the signal space?



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#### **BETWEEN SYMBOLS AND SIGNALS**



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#### HARVEY'S BELL

# Mortuos Plango, Vivos Voco (1981)

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Mortuos Plango, Vivos Voco is notable both within and without Harvey's career: "it showed that IRCAM institute's apparently esoteric research programme could yield music capable of appealing to a wider audience"

#### **Curtis Roads**

#### **ASSISTED ORCHESTRATION: CONTEXT**

In 2003, I presented to Ircam a proposal for a long-term research project on the subject of computer-assisted orchestration. The results of this research project lead to the prototype softwares, 'Orchidee'

Yan Maresz, On Computer-Assisted Orchestration, Contemporary Music Review, 2013

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Automatic orchestration is a long-standing problem researched at Ircam for about 15 years

Different parallel tools developed: a Matlab frameworks, Max/MSP interfaces, C++ standalone command line tools, etc.

Several PhD thesis including G. Carpentier, D. Tardieu and P. Esling and several journal papers

#### **COMPOSITION AND ORCHESTRATION**



### **COMPOSITION AND ORCHESTRATION**



### **COMPOSITION AND ORCHESTRATION**



#### **ORCHESTRATION: PROJECTION**



# **ORCHESTRATION: PROJECTION**





#### **ORCHESTRATION: INDUCTION?**



#### **ORCHESTRATION: INDUCTION? Orchestration : induction**



#### **KATHARSIS AND MIMESIS**



#### **PROBLEM STATEMENT**

• How an orchestra can be used to reproduce a target timbre within a compositional context?

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- How an orchestra can be used to reproduce a target timbre within a compositional context?
- How can we find a combination of instruments that:
  - Best matches a given target sound?
  - Fits writing constraints specified by the composer?

## **PROBLEM STATEMENT**

- How an orchestra can be used to reproduce a target timbre within a compositional context?
- How can we find a combination of instruments that:
  - Best matches a given target sound?
  - Fits writing constraints specified by the composer?
- More formally:
  - A combinatorial optimization problem defined on timbre description
  - A constraint solving problem on the variables of musical writing

# HYPOTHESIS ON SIMILARITY

The features of a combination of sounds can be predicted from the values of individual features



## **MULTIOBJECTIVE HEURISTICS**

 Relative importance of perceptual dimensions cannot be known without prior information on listening preferences

#### MULT Multiobjective approach

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 Set of optimal solutions (implicitly corresponding to different listening preferences)

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#### **COMPUTER ASSISTED ORCHESTRATION 12/12**



### PART 2: COMPOSITIONS

### PANE, SALE, SABBIA (2017)

- Instrumentation: opera for four voices, chamber orchestra and electronics
- **Commission**: Ukho ensemble, Kiev
- First performance: 15 june 2017, National Opera, Kiev, Uhko ensemble, Luigi Gaggero
- **Duration**: 1 hour, 3 scenes in a single act
- **Production**: january-june 2017
- **Subject**: a true story happened in Italy in May 1944













#### **PRODUCTION IN KIEV**





# **ASSISTED ORCHESTRATION (EXCERPTS)**

Third scene is a sort of *marche funébre* where the orchestra plays orchestrations

of bells created by the Orchidea toolbox



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Third scene is a sort of marche funébre where the orchestra plays orchestrations

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#### **CAN WE ORCHESTRATE A PARADOX?**

# Shepard's glissando

#### **CAN WE ORCHESTRATE A PARADOX?**

# Shepard's glissando

#### **REFLETS DE L'OMBRE (2013)**

- Instrumentation: large orchestra and live electronics
- **Commission**: IRCAM Radio France
- First performance: 6 june 2013, Salle Pleyel Paris, OPRF, Jukka-Pekka Saraste
- **Duration**: 18 minutes
- **Production**: jan-june 2012 musical research, oct 2012-june 2013 studio work



#### **INSPIRATION**



#### REFLETS DE L'OMBRE 5/7

#### **COMPOSING WITHIN SOUND**





#### **EXCERPT (SECTION 4)**

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#### THANK YOU!!!



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