

## **Séminaire des jeunes chercheurs du GREAM**

MISHA - Salle Asie

Mardi 13 février 2018

17h - 19h

Présentation du travail de recherches de thèse de Pavlos ANTONIADIS

« Embodied navigation of complex piano notation:

Rethinking musical interaction from a performer's perspective »

(Navigation incarnée de l'écriture complexe pour piano:

Réflexion sur l'interaction musicale de la perspective d'un interprète)

CONCEPT: Interaction vs Interpretation, TUI vs UTI

This thesis proposes a performer-specific paradigm of embodied interaction with complex piano notation. This paradigm, which I term embodied navigation, extends and even confronts the traditional paradigm of textual interpretation. The latter assumes a linear and hierarchical process, whereby internalized understanding of the musical text is considered a prerequisite of instrumental technique towards personal interpretation. I call this classical paradigm UTI: Understanding-Technique-Interpretation. In lieu of that, I advocate for a dynamic, non-linear, embodied and external processing of music notation, even without the need for mental representations on the part of the performer. Music notation is theorized as a state-space of affordances, to be navigated by the performer during a diachronic learning trajectory. The pianist manipulates and processes notation through physical movement, as if it were an extension of her instrument. To take the metaphor even further, the pianist touches notation as much as she touches the instrument, and this action constitutes cognition. I term

this conception of notation TUI: a Tangible User Interface, enabling a composer-performer-listener communication based on corporeal articulations.

**TOOLS:** Gesture capture, Interactive notation

At a second stage, the proposed paradigm serves as the basis for the development of methodologies and customized tools for a range of applications, including: performance analysis, embodied interactive learning, composition and improvisation. The tools in question include gesture capture, gesture analysis, gesture following and gesture interaction tools developed at Ircam (MuBu for MAX, motionfollower, augmented violin project), the system of capacitive sensing Touchkeys, as well as interactive notation platforms (INScore), combined in the customized system called GesTCom (Gesture Cutting through Textual Complexity).

**METHODOLOGY:** Practice-led research, theoretical and empirical, informed by musicology, embodied cognition and HCI

The concept of embodied navigation emerges out of my personal, expert user perspective as a professional pianist for new music. Thus, it falls into the category of practice-led research and often features subjective, first-person descriptions. At the same time, this research is interdisciplinary, informed by a variety of theoretical tools, empirical methodologies and objective data captured during my praxis at the studio of LabEx GREAM and at Ircam: In that way, it reaches towards third-person descriptions. In particular, this research is informed by the performative turn in musicology and related disciplines, by the field known as embodied cognition and by developments in Human-Computer Interaction and in the NIME (New Interfaces for Musical Expression) community.

**STRUCTURE:** Why, what, how and case-studies

The thesis is articulated in four parts.

The first part addresses the following question: If and why does complex piano music necessitate an embodied interactive paradigm, which differentiates itself from the traditional interpretation paradigm. I attempt to answer the question by looking at developments in both music creation and in musicology. As far as the music creation is concerned, I explore a wide range of postwar repertoire along three overlapping axes of complexity: intrinsic notational complexity; complex interactions with electronic media; and the theatrical investment of the performative body. I examine discourses, by composers and performers, under the light of

theories by (indicatively) Zenck (corporeal subtext), Lehmann (the digital revolution of new music), Fischer-Lichte (aesthetic of the performative) and Drees (body-media-music). In that way, notational complexity is defined as intra- and inter-complexity, pointing at different types of interaction with the body and the media. As far as musicology is concerned, I am looking at the performative turn in the English- (Cook-beyond the score), French- (Lalitte-analysis of 20th century music interpretation ) and German-speaking (Hiekel-music embodiments) academia and its aporias, namely the problematic ontological status of the musical score in performance-oriented methodologies. I eventually suggest that the UTI model is inadequate for these repertoires and results in the aporias witnessed in the performative turn.

The second part addresses the question: What could be the alternative to the UTI paradigm. I show how developments in cognitive psychology resonate with the unseating of the UTI paradigm and I introduce my embodied and medial alternative under the name “embodied navigation of complex notation”, featuring a TUI concept of notation. I am drawing from both the general field of embodied cognition (Gibson’s ecological psychology, Rowlands’ 4E cognition, Chemero’s radical embodied cognitive science and Lakoff’s metaphor theory), tending towards a radical anti-representationalist dynamic stance; as well as from the field of music embodied cognition, notably Leman’s mediation theory and Godøy’s notion of co-articulation and sound-action chunks, as well as other studies on musical gesture, for example Guerino Mazzola’s notion of Hypergestures.

The third part addresses the question: How can the embodied navigation paradigm contribute to the development of interactive tools for the recording, analysis and integration of gesture in augmented dynamic notational representations. I will introduce technological implementations of notation as gesturally controlled interface, by investigating: gesture modeling as conducted at Ircam by the ISMM (Interaction-Son-Musique-Movement) team as well as the predecessor of the current GesTCom project, the augmented violin project (Kimura & Bevilacqua); interactive notations featuring in the TENOR (Technologies for Music Notation and Representation) communities; new interfaces as presented by the NIME (New Interfaces for Musical Expression) community; and wider perspectives on movement modeling from the MOCO (Movement and Computing) community. Ideas and concepts from the history of HCI (Human Computer Interaction) will further frame the argument for a radical revision of the role of notation as extension of the instrument.

Eventually, the fourth part will put at work the concept of embodied navigation and the corresponding tools, in the form of case-studies. A wide range of complex piano music,

pertaining to all three axes of embodied interactive complexity will be examined: works by Iannis Xenakis and Brian Ferneyhough which allude to the usual meaning of intra-notational complexity; pre- and post-complexity in the work of Olivier Messiaen and Mark Andre; action notation with theatrical consequences in the work of Helmut Lachenmann and Wieland Hoban; mixed music and live electronics with examples by Luigi Nono and Nicolas Tzortzis; generative composition and improvisation in the work of Panos Ghikas and myself. This chapter will show hands-on examples of how the theoretical framework of embodied navigation and the prototype tool called GestCom may be used for the gestural analysis, learning and composition of complex piano scores.

In the addendum, I will show how the conclusions, concepts and tools for complex music can be extended to the common-practice repertoire, with selected examples and analyses and some ideas for their pedagogical application.