

Challenges in designing an instrument when pursuing a specific artistic vision

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ABSTRACT

In my ongoing practice based research project “*The music of language and language of music*” [1] I am looking at ways to make music using prosodic features of speech as a structural input source. By this I wish to highlight the many parallels of speech and music in general, and spoken dialogue and improvised interplay in particular. To employ improvisation means working in real time, which lead me to start developing a real time compositional environment - a kind of specialized instrument for this purpose, where speech is serving as structural input and the user is controlling how the prosodic features are utilized to create music and sound.

There are several design challenges in this project: which features to extract; what parameters and processes to control; choice of interface; etc., which all will affect the final musical possibilities. A concern in this regard is to what degree it will be a valuable contribution for a broader field if developed exclusively for my specific artistic needs and visions? And further, what do these visions consist of, and which part do they play in a practice based research process?

Keywords

Instrument design, speech and music, practice based research.

1. INTRODUCTION

In instruments controlling higher-level musical processes rather than making sound directly, there is a certain overlap between preconceived compositional ideas and the design of the instrument itself. Here I will give some thoughts on my ongoing practice based PhD project in order to highlight some of the challenges in such a design process.

2. PROJECT OVERVIEW

The project explores how the prosodic structures of speech can be used as a source for creating music. The aim is to develop an improvisational foundation for making music that is closely related to the genuine human musicality inherent in spoken language.

The linguistic term “prosody” refers to intonation, rhythm, dynamics, tempo, register, voice quality – in other words all the *musical* features of speech, and this project is based on the increasingly widespread idea that there is a deep connection between how prosody is used to convey and interpret meaning in speech and how musical expression works in the esthetic domain [2] [3]. This can be especially apparent in improvised music, where the musical discourse and development

is negotiated in much the same way – and with the same prosodic/musical means – as in a spoken dialogue [4] [5].

Linguists, discourse analysts and semioticians identify a range of prosodic phenomena, which can be used as a starting point for musical exploration [6] [7]. These play an important part in unrehearsed conversation where speakers are constantly trying to hermeneutically interpret each other’s intent. They include for instance the use of *tempo rubato* versus uniform rhythm to express degree of personal or formal relationship; monotony versus larger range in dynamics and pitch to express degree of emotionality; discourse markers like stress and pitch accents to highlight important information; the use of tonal modulations; overall pitch contours to communicate turn-taking, continuation or conclusion (i.e. *form*) etc. While linguists look at how prosody affects discourse and flow of information, it is from a musical point of view interesting to see how these structures also make recognizable and meaningful patterns in music. Some of these only make sense in light of the lexical content, but others make up a separate communication layer on its own and can thus be considered a linguistic-musical base material from which to go exploring.

2.1 Context

Many composers and musicians have used speech in music, and Vincent and Lane [8], [9] identifies some 19 different approaches including field recordings, collages, sound transformations, melodic transcriptions, mechanical or orchestral reproduction of spectral analysis etc. Many have focused on the *sound surface* as musical material, the *voice* as icon for personality, the poetic dynamics of words and sound, or *intonation* directly as melodic motifs. This project could add a new perspective by rather using abstractions of a wide range of underlying *prosodic* traits: rhythmical, spectral, harmonic and gestural structures – shapes and proportions which on a deeper level resonates with the way we are sensitive to sonic utterances. This, together with bringing this material back into a *musical* dialogue and thus highlighting improvisation as discourse and language-like process both in music and conversation, is perhaps what makes for an interesting and original approach in this project.

2.2 Methods

This project raises at least three different methodological questions: *what* kind of speech to use, *which* features to analyze and extract, and *how* to explore this material musically in practice.

2.2.1 What kind of Speech

Since I am particularly interested in the link between everyday conversation and improvised music I am focusing on *dialogues* as source material, covering a broad range of prosodic characteristics typical for the different discourse genres used in different social settings, such as *telephone calls*, *small talk*, *public debate*, *questioning*, *pillow talk*, *argument*, *confession*, *negotiation*, *child nursing* etc.

2.2.2 Which features to analyze

Digital instruments can be seen as a construction of many processes which can be classified in terms of their functions, including *analysis, transformation, synthesis* and *memorization* [10]. As my analyses are concerned primarily with the *prosodic* traits as described above, this means segmentation into syllables, accents and breath groups; contours of pitch and amplitude; articulation; voice quality etc., as well as higher level musical features like tempo variation, key, melodic or rhythmic figures, and so on. This means developing a repertoire of techniques and tools in order to extract, abstract and transfer these prosodic structures into musical shapes.

2.2.3 How to explore musically

To give an idea of how this can be used as a source for making music that is not merely a direct transcription of speech into sound, consider the way composers and improvisers can use some specific musical material as the basis for a composition or improvisation, be it a rhythmic, harmonic, melodic, or timbral motif, particular soundscapes or even abstract ideas, and *play* with these structures to create a coherent musical piece or performance. In much the same way I envision a way of working with individual prosodic features as musical source material. This way of *deconstructing* and *abstracting* prosodic traits can for instance involve working individually with rhythmical stress patterns, tempo fluctuations, pauses, phrase contours, etc.

3. DISCUSSION

3.1 The role of artistic visions

Before I go into my main question regarding contribution and specific artistic vision, it is necessary to try to define what this *artistic vision* consists of. This is not easy, as it does not necessarily consist of clearly articulated thoughts but rather is a composite of sonic ideas, creative associations, and notions based on previous knowledge that might also be unarticulated. However, the way I envision a method of musical exploration as described above is part of this vision. These ideas, which when concretized essentially can be broken down to a series of *artistic hypotheses*, constitutes the foundation for the practical part of the research. After developing sufficient tools for analyzing low level features like syllables etc., it is the musical *examination* and attempts at *verification* of these ideas that drives the research and the development of the instrument. We then have an interaction between the linguistically inspired creative ideas on one side and the musical examination and exploration on the other, where the insights gained through the practical research influences not only the *design* of the instrument but also its *foundation* – the artistic vision of possible musical outcomes. An example of this is the way I have tried to extract tempo variations in speech based on prominent syllables, which in Germanic languages tend to conform loosely to a metric with an even pulse [6]. To do this accurately in real time is not completely straight forward as syllable prominence is not necessarily expressed through acoustically measurable features like stress or pitch accents but also relying on vowel length or simply inferred from the syntax. For a musical purpose though, my implementation based on stress patterns seems to work. My reason for looking at tempo in the first place was based on a musical vision of playing with the continuum between the free flow characterizing speech and the formalized character of conventional music, usually quantized both in time units (meter and tempo) and fixed pitches. At the same time, in pursuing this I enabled the creation of other musical structures involving tempo and pulse drawn from speech. This in turn triggered a series of new ideas that begged to be explored musically and thus had to be catered for, and in this way the actual practice of playing the instrument fed back into the development of the instrument itself. This is how such a project differs from developing an instrument based on an already given and fixed specification, since the practical

verification of the assumptions this project relies on plays a direct role in its design and development.

3.2 What constitutes a contribution

As Scrivener [11] notes, many artists already do such research as part of their everyday practice, but that this is for the most part is directed towards the *individual's particular goals* rather than seeking to add to our shared store of knowledge in general. As practice based research aims to generate apprehensions novel not just to the individual creator, this is what distinguishes researcher from practitioner, and for this to happen this knowledge must not only be new but also be transferable and shareable. If I am to follow this I can rephrase my question as *to what degree can this project make a contribution if grounded and driven by my particular artistic goals?* As I have tried to show, these goals can play an integrated part as a catalyst for practice based research. So as long as there is an original approach with methods that can produce shareable and novel apprehensions, there need not be a conflict between pursuing an artistic vision and making a valuable contribution.

In this regard, what constitutes a contribution is not restricted to the specific instrument or the resulting music (which represents one of several possible outcomes of a more general question, in this case how to make music based on analyzing structures unfolding in time, also relating to motion and gesture in general), but rather the sharing of the knowledge and insights developed during the process, both regarding language, music and technical solutions.

4. CONCLUSION & FURTHER WORK

I have shared some thoughts from an ongoing practice based research project, reflecting on the relationship between personal artistic visions and contribution for a broader field. My project will continue to develop with the aim that it shall mature into a coherent set of flexible tools acting together as different parts of an instrument. Further challenges will include ideas for overall interface design and playability, and not least a thorough exploration of musical possibilities.

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