SCHEDULED VISUAL CONTACT AS A STRATEGY FOR IMPROVED COMMUNICATION IN A LIVE CODER AND PIANO ENSEMBLE

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ABSTRACT

This paper discusses some of the performance issues associated with the hybrid ensemble of an acoustic musician and live coder. The role of visual contact and non-verbal communication is a key element of conventional ensemble playing and one that is largely absent in live coding practice. Through a series of exercises, we experimented with the imposition of compulsory visual contact moments, and consequent non-verbal communication, between the live coder and acoustic musician at various time intervals. A reflection on these exercises, alongside further deliberations on hybrid ensemble techniques, are discussed in the paper.

1. INTRODUCTION

Hybrid ensembles of an acoustic instrumentalist with a live coder, whilst still a minority, have become more present in the live coding community in recent years.[1] The mixed combination poses a number of issues which many coders have addressed through the development of technological tools (Hall 2015; Ogborn 2015) or even entire languages, such as McLean's *Tidal* (McLean 2015). We are classically trained musicians and form the hybrid ensemble *Off<>zz,* in which Veinberg plays the piano (or other acoustic keyboard instrument) and Noriega live codes in SuperCollider. We wanted to continue collaborating and approach some of the associated ensemble issues from a conventional chamber music perspective and draw from performance practices of the classical music tradition to explore potential solutions.

The use of *non verbal/text-based communication* between players is a key element of ensemble playing in conventional chamber music (Williamon and Davidson 2002; Davidson and King 2004; Goebl and Palmer 2009) and one that is largely absent from live coding practice.[2] When combining acoustic and live coding musicians, the lack of visual contact from the live coding collaborators can translate to an isolating experience for the acoustic musician. This in turn may lead to errors in ensemble synchronicity and misperception of the musical intention of co-players. To combat this, we experimented with imposing compulsory visual contact at various time intervals through a series of exercises.

This paper will describe these exercises and reflect on how they influenced our style and shaped our performance experience whilst playing. To conclude, a brief discussion of other potential means of enhancing ensemble playing in a live coder and pianist setting will be considered.

2. THE EXERCISES

We made a series of exercises in which compulsory visual contact was imposed onto our improvisations every 120, 90 or 60 seconds respectively. These exercises were inspired by the eye-contact observed between

[1] Some early hybrid collaborations include Alex McLean (code) with Alex Garacotche (percussion) in 2004 and Matthew Yee King (code) with Finn Peters (flute) 2011. However, even at the 2013 Live Coding Festival in Karlsruhe, there was only one act combining live coding with instrumental playing. In comparison, at the International Conference on Live Coding in 2015, there were seven hybrid ensemble performances and a paper on the matter presented. Also of note is Thor Magnusson's "Threnoscope" with which he regularly collaborates with an array of acoustic musicians.

[2] Whilst there is no study measuring the regularity at which live coders look away from their computer screens whilst playing, in observations of live coders at the Karlsruhe Festival of Live Coding in 2013 and the Leeds International Conference of Live Coding in 2015, this happened very seldom. In live coding ensembles there is often no reason to look away from the computer screen, as tools for communication are incorporated in the software setup of the group.

co-players of a piano duo at "important" moments in the music (Williamon and Davidson 2002). In their study, rehearsal figures, structural changes and entrances of parts after periods of rest qualified as important to the music and consequently to the ensemble playing itself. However, as our exercises were improvised[3], we could not predetermine these 'important' musical moments from an existing score. Instead, we worked in reverse and used the set visual contact moments to predetermine that 'important' musical events could occur.

To alert us that the designated time interval had passed, we used a stand alone application that produced a red window on our screen and flashed green at the selected interval mark.[4] These flashes served only to alert us that we were due to make non-verbal contact and did not work as musical cues by themselves. We were allowed an approximately 10 second leeway in making the visual contact after the flash, so as to accommodate the musical direction of the moment, and the duration of the visual contact itself was not set.

At every appointed contact moment, we had the opportunity to make an 'important' change to the music. That is: bring in a new layer in the form of a piano voice or electronic sound, dramatically change the tempo, drastically change the parameters of current material or silence one/several/all parts. However, it was not defined that a substantial musical event had to occur on the assigned moments, simply that the performers should make non verbal contact at this time and be aware that at this moment such a change *could* occur.

2.1 Initial reflection on the exercises

Exercise 1- time interval 120 seconds.

From both the perspective of the pianist and the live coder, we felt the presence of shared visual moments was a positive contribution to our musical experience. We were surprised at how long 120s felt whilst playing and found that on several occasions we were musically ready to progress to a new section but had to wait for the visual cue before doing so.

Noriega commented that the 120s time interval influenced his coding style. At times he would complete writing his intended code for the 120s segment but had to wait for the visual contact before executing, using the remaining time to work on a different parameter elsewhere in the code. This created an asynchronous, parallel-layered approach to his code conception and took away from his natural approach of linear development in live coding.

At times Veinberg found it difficult to maintain the same musical material for the entire duration. Nonetheless, it was of huge support for her to share visual contact every 120s and be gesturally guided by the live coder as to when an important musical event would be executed in the computer code[5].

Exercise 2- time interval 90 seconds.

This was a much more comfortable time interval to work with. It gave us enough time to develop our ideas, without them expiring whilst waiting for the next cue. Noriega found that with this time interval he could write his code comfortably and still have time to wait for the contact moment in order to trigger the execution of the code.

Exercise 3- time interval 60 seconds.

We were divided on our experience of the 60s interval. On the first attempt, Veinberg, as the pianist, appreciated the more frequent contact moments as this more closely resembled ensemble playing in a conventional setting. Noriega, however, found that this shorter interval often came whilst he was in the midst of programming an idea, which resulted in the contact moment working as an interruption rather

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[3] This paper refers to the exercises as being "improvised". This is to say that the musical material was not composed in advance or notated in anyway. We were not aiming to be "free improvisors" (Bailey 1993) who were actively avoiding instrumental idioms and aiming to create completely new musical material each time. In fact, we embraced returning to similar musical gestures and ideas throughout the different exercises. We relied on our aural skills to guide the musical content, actively drawing from our memory of the material from prior attempts, without striving to recreate it note for note or executing the same lines of code and parameters.

[4] The specific timer application that we used was programmed by Rob van Loon and can be found here https://github.com/borrob/VisualTimer_OSX.

[5] Note the "gesturally guided". In a performance setting, the pianist can see the live coder's code, and can therefore read when a sonic event may occur. However, without "gestural guidance", it is the same as having the sheet music part of a co-player but not having any visual contact with that co-player so as to know when the execution of the prescribed notes will occur.

than a useful tool for interaction. Many of the visual cues were missed by the players. In a second attempt, both live coder and pianist felt more comfortable with this time period, despite still missing several cues.

General remarks

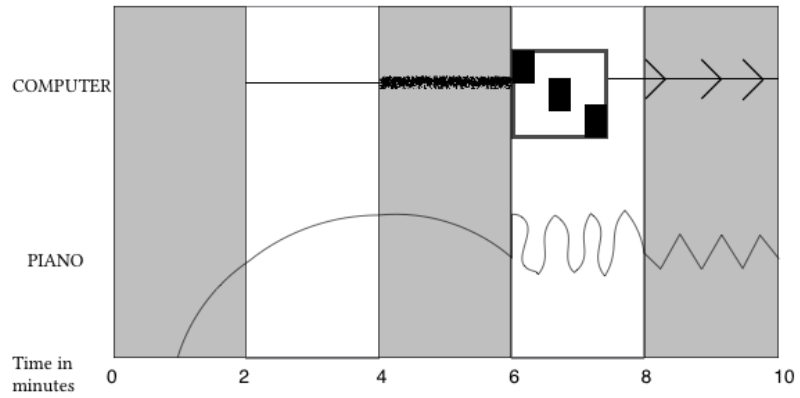
This system of forced contact took some time to adjust to. Our initial reaction was to force ourselves into making substantial musical changes at every cue point, even when the music did not call for it. An interesting by-product of the designated contact moments was the natural increase of visual contact in-between cues.

2.2 Subsequent analysis of the exercises

In analysing the exercises on a more detailed level, we observed that despite the rigidness of the equally spaced contact moments, the organic development of the music was preserved, and remained on a whole key to our improvisations. There were a number of instances when new parts were added outside of the contact moments but it is questionable whether these qualify as new parts or as material development. Interestingly, there were four missed cues by the piano and only one in the computer during the 60s exercise despite the pianist's strong enthusiasm for this interval.

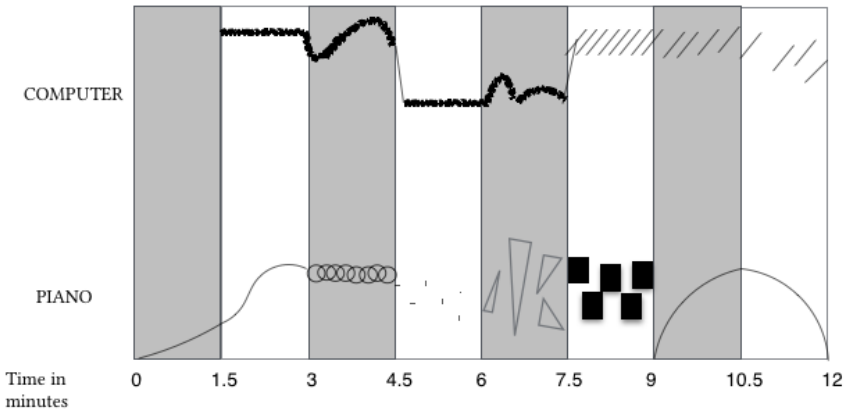
Exercise 1

There were substantial musical changes made by at least one of the players at every contact moment. At the 6' mark, there was a large change for both players. From the figure we can see that the coder had no issues with completing a change within the 120s time block and did so at every contact moment except the last.



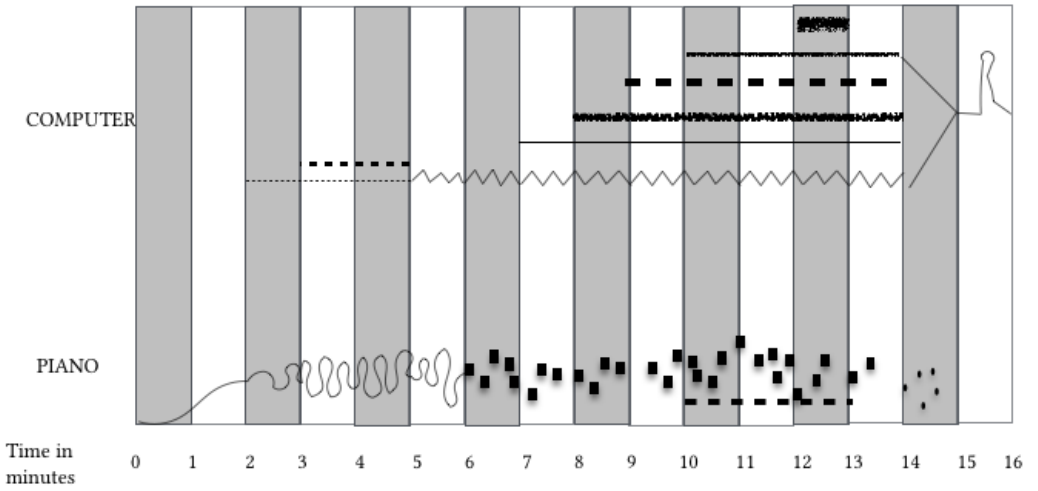
Exercise 2

There were again changes in musical material at every contact moment, and at the 4'30'' and 7'30 mark, there was a change by both musicians. The coder was again successful in completing his intended code in between the contact moments and developed a tendency for establishing a sound in one block and developing it in the second one before moving onto different material.



Exercise 3

There were moments at the 4' and 11' mark where no changes were made by both pianist and coder. Not surprisingly, these moments directly correlate with the musicians' missed cues. There were joint changing moments at the 3', 10' and 14' mark. On several occasions both the pianist and live coder did not change their own material at the 60s mark, resorting to using a full 120s with their material even whilst making the visual contact half way.



3. FURTHER EXPERIMENTATION AND FUTURE CONSIDERATIONS

The main aim of the scheduled contact moments was to increase visual communication between players. Through the imposition of this contact, the structure of our improvisations was also influenced. To further explore the potential of the contact moment influence on the structure, on a later occasion we undertook similar experiments but defined the contact moments to include a *compulsory* musical change at the moment. Overall, we were not enthusiastic about the results, feeling that much flow, developmental momentum, and freedom was sacrificed and that it created a disconnectedness between the players and music. In conclusion, we preferred the original guidelines for the contact moments, where musical changes were voluntary, as these influenced the structure without limiting it.

In our initial exercises we kept with a regular time interval of 120, 90 or 60 seconds respectively. Further experimentation led to trying out other time intervals, including working with a 75 second interval. This 75 seconds felt very comfortable and was a good compromise between the 90 and 60 second interval for both the live coder and pianist. Future experimentation will include the composition of different time structures which will use varied time intervals succeeding one another, a live coding layer of the routine that would control and generate the time intervals, and further experimentation with public interaction through a dedicated web application.[6]

At ICLC 2016, we will present a performance where audience members can contribute to the structure of our improvisation by determining the duration of the subsequent time interval in real-time.[7]

4. OTHER ISSUES AND CONCLUSION

Having found a solution to establish regular visual contact with live-coding co-players, we are interested in exploring ways to maximise what can be communicated at these moments. For an instrumentalist, physical gestures directly reflect their sounding outcome and immediate musical intention. For playing together with a live coder, it may be worthwhile to develop a system of gestures that would enable an instrumentalist to communicate their intended musical direction to the live coder in advance. This would allow the live coder time to program their response to instrumentalist's musical expression before the fact.

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6 The web application timer was also built by Rob van Loon and can be found here https://github.com/borrob/WebTimer

7 See performance abstract of Anne Veinberg and Felipe Ignacio Noriega 's *Guide our Glance: Off<>zz performance*

Where live-coding laptop ensembles make use of synchronization tools (Lee and Essl 2014), in a hybrid ensemble, the acoustic instrumentalist must assume responsibility for the ensemble's synchronization to an even greater degree than in conventional ensemble playing.[8] This role distribution is due to the computer's ability to accurately interpret the live coder's intended tempo and the complexity of actions required by the live coder in order to adjust to the pianist's micro tempo fluctuations, in real time, without the assistance of machine learning or other pre-coded tools. Using a monitoring earpiece may assist the pianist in more easily staying synchronized with the live coder's produced sound.

These aspects, among many others outside the scope of this paper, are still to be explored and potentially incorporated into the performance practice of hybrid ensembles. The increase in visual contact between players, as explored in this paper, is an element that was originally missing in our practice, but through the exercises, one that we began to assimilate. The scheduled contact moments are of impact far beyond the performers' playing experience and extend to the musical structure and general ensemble unity. Whilst *performing* with these contact moments may not be suited for everyone, we would encourage undertaking such exercises as training in communication for hybrid ensembles.

Acknowledgments and Supporting Material

Many thanks Rob van Loon for building the timer-flash application and web interface for the live audience input.

Documentation of these exercises can be found here www.keyboardsunite.com/visualcontactexperiment

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[8] All musicians in an ensemble are constantly making micro-adjustments in tempi to accommodate co-players whilst playing on both a conscious and subconscious level (Goebl and Palmer 2009; Wing et al. 2014) In a hybrid ensemble, the acoustic musician cannot rely on the live coder to make these micro-adjustments to their playing, hence the responsibility for synchronization is even greater than conventional chamber music.