

Collaborative Musical Improvisation in a Laptop Ensemble with LOLC

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ABSTRACT

This paper discusses LOLC, a text-based collaborative music improvisation system for laptop ensemble developed by the authors. The paper evaluates LOLC in the context of a recent performance by professional classical musicians with minimal computer experience. Using qualitative data from interviews with the performers and quantitative data from server logs, the paper considers the degree to which LOLC facilitated collaborative improvisation among the musicians and the degree to which LOLC was accessible to non-programmers to learn and perform.

Authors Keywords

Live coding, laptop orchestra, improvisation, collaboration

ACM Classification Keywords

J.5. Arts and Humanities: Music

General Terms

Experimentation

INTRODUCTION

We designed and developed LOLC [6] to take advantage of the unique potential of text-based performance environments in larger-ensemble collaborative improvisation and to build upon the rich history of collaborative improvisation in jazz and avant-garde musical styles. In LOLC, musical patterns are coded symbolically and shared automatically, providing a foundation through which laptop musicians can effectively improvise and collaborate by borrowing and transforming the material created by others in the ensemble. In addition, we also wanted to make LOLC accessible to non-programmers, including skilled musicians without any experience in programming or computer music. LOLC is thus deliberately limited in complexity and scope: it is not a Turing-complete programming language and consists entirely of single-line expressions.

In this article, we briefly review the related work upon which LOLC builds and we then evaluate LOLC in the context of a recent performance by an ensemble of professional classical musicians who had no background in computer programming and little or no background in computer music. We consider the degree to which LOLC facilitated collaborative improvisation among the musicians and the degree to which LOLC was accessible to non-programmers to learn. For detailed information on the LOLC environment itself and our motivations for creating it, see [6].

RELATED WORK

The design and implementation of LOLC was influenced by existing models for collaborative text-based laptop performance and by approaches to collaborative improvisation in other types of ensembles.

Laptop-based musical ensembles can often collaborate more effectively when they share a common clock and code and/or music over the network [2,4], and some researchers have suggested environments that enable users to share actual code fragments among members of the ensemble [4,8]. The Hub's work *Borrowing and Stealing* [3] offers an intriguing model that served as a direct inspiration for LOLC. In addition to the ideas of live coding languages, LOLC was influenced by collaborative improvisation in other types of ensembles that have created structured strategies for ensemble improvisation in their works [1,7].

EVALUATION AND DISCUSSION

This section focuses on a single performance with LOLC in January 2011, in which musicians from a professional contemporary music ensemble performed with LOLC. These top-tier classical musicians have played with major symphony orchestras and also have considerable background with improvisation in experimental and/or jazz mediums. The musicians had no prior experience with LOLC, no (or negligible) background in computer programming, and little or no experience with using computer music software. The musicians started to learn LOLC through hour-long, one-on-one introductory sessions led by the authors, then practiced individually by following tutorial files and trying out LOLC on their personal

computers. The ensemble rehearsed together for a total of 12 hours in preparation for the public performance. During the rehearsal process, we provided technical assistance and guidance on the environment, but let the ensemble develop their own structure for the improvisation and decide how to build the piece collaboratively. Following the concert, we conducted an hour-long interview with each ensemble member to discuss his or her process of learning LOLC and experience of performing with it. In addition, we logged code and chat messages to disk and analyzed each log quantitatively.

Collaborative Improvisation

Since LOLC's primary goal is to facilitate collaborative improvisation within a laptop ensemble, our evaluation focused on how musicians borrow, re-use, and transform musical patterns. We found a healthy level of collaboration among all musicians. During the dress rehearsal, for instance, the musicians created a total of 61 musical patterns; 19 of those patterns (31%) were based on patterns borrowed from others. The musicians scheduled a total of 117 different variables for playback; 37 of these patterns (32%) were borrowed from another musician. Although these statistics do not necessarily correlate to the quality of collaboration, they indicate a critical degree of sharing that is prerequisite to effective collaboration in LOLC, and they demonstrate that musicians were responding to each other through the music they improvised.

Borrowing and transforming often became a chained process for the ensemble as musicians borrowed patterns that were themselves borrowed. One pattern from the dress rehearsal was based on 11 prior patterns (seven created from scratch) created by 5 different musicians in the ensemble over the course of nearly 15 minutes. To us, LOLC's ability to facilitate the integration of ideas from so many musicians over such a long time scale attests to its potential to facilitate collaborative improvisation in an ensemble, using its ability to preserve the history of creation and collaboration within the performance to enhance the ability of musicians to borrow, transform, combine, and recall musical material.

Accessibility

Despite the fact that the five musicians in the ensemble had no (or negligible) exposure to computer programming, all of these musicians were able to learn LOLC fairly quickly and mount a public performance with the environment. All of the musicians found the experience of learning and playing with LOLC to be straightforward, saying that it was "easier than I thought it would be" and that it was "pretty easy to use once you get the hang of it." They also found the combination of self-guided practice and group rehearsals to be an effective means to learn LOLC.

We also asked the musicians if they were musically satisfied with the performance. This quote from one of the musicians summarizes the attitudes of all of the musicians towards the experience: "I thought it was satisfying.

Honestly, I had a great time working on this (...) and to me it was musically satisfying."

Apparently, for the musicians, LOLC was more than just accessible: they enjoyed the learning process and were proud of what they had accomplished.

FUTURE WORK

Based on our evaluation of a performance by professional musicians with no programming experience, we believe that LOLC has largely succeeded in facilitating collaborative improvisation within a laptop ensemble and in being accessible to use by non-programmers.

In the coming year, we are extending LOLC to the realm of real-time notation, in which musicians sight-read conventional or graphical notation live, in performance, as it is rendered on a digital display [5]. Performances with this extended system are already planned for 2012.

ACKNOWLEDGEMENTS

LOLC is supported by a grant from the National Science Foundation as part of a larger research project on musical improvisation in performance and education (NSF CreativeIT 0855758). We also thank all the musicians of Sonic Generator. Additional information is available at <http://www.jasonfreeman.net/lolc/>

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