Human Coded Orchestra:
a System for Extemporary Group Singing Performance

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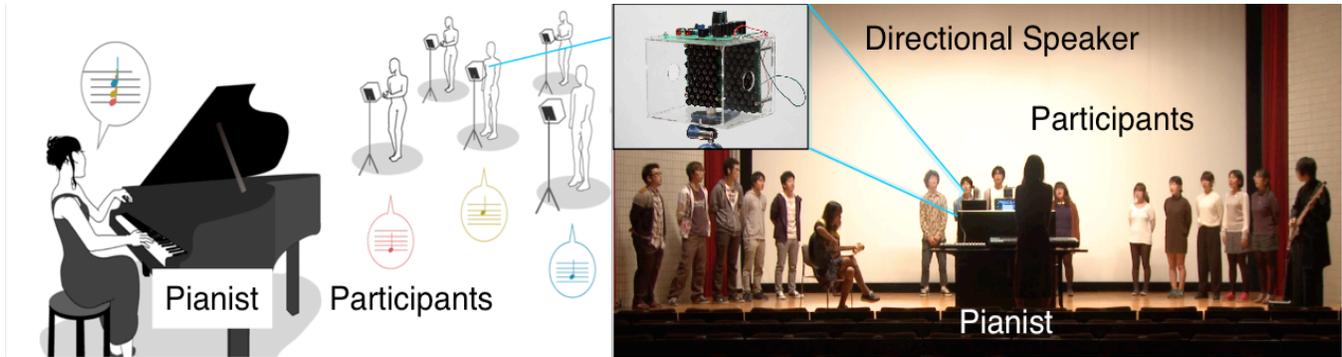Affiliation
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Figure 1: *Application images of Human Coded Orchestra: a System for Extemporary Group Singing Performance. Left: the ideal use of Human Coded Orchestra. Right: user study of our system. Participants sing a song successfully without much practice beforehand.*

1 Introduction

In this paper, we present Human Coded Orchestra, a computed system that allows a group of people to sing a complicated song in harmony without much practice beforehand. Its core idea is to create a controlled environment in which participants are directed to make sounds that are made by computed directional speakers. In Human Coded Orchestra, the participants are asked to do only one simple thing, which is to sing to the pitch they hear. By giving only auditory cues, the system has made the rule simple and the learning cost low. It is designed not only to produce a complex musical output but also to be universal and expandable. The uniqueness of the present work is that it has been developed based on the knowledge on human factors. By utilizing the methods on calculating the accuracy of imitated sound, the authors have scientifically explored the possibilities of the system.

2 Related Work

A number of studies have examined how an untrained user can deliver a musical performance effectively. For example, "P.I.A.N.O"[Weing et al. 2013] projects images onto the piano in real time to show which keys to play and support faster learning. This approach suggests that musical performance by individuals can be successful if the instructions are delivered to them in real time, even though they have not practiced beforehand.

The present work is inspired the idea of human direction. "Haptic Turk"[Cheng et al. 2014] directed users by giving computed visual cues to them, and this approach seems to be well-founded in order to produce a complicated output out of untrained individuals.

3 Applications

One of the main possible applications of Human Coded Orchestra would definitely be interactive stage performance. It certainly has the ease of application to an interactive performance area. For instance, musical artists is likely to be able to play a song together with the audience, who work as another musical instrument as a whole, by using Human Coded Orchestra, for example. Considering the results of evaluation in our experiments, this kind of application has the capability of making musical performance ever more interactive and exciting in a completely innovative way. Human Coded Orchestra also has the potential to help individuals sing in harmony in karaoke. Speakers can be installed in a karaoke room, directed towards different directions, enabling the present to sing in harmony merely by imitating the sound that they hear. It will certainly enhance enjoyable group karaoke experience.

References

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