

ISE 599 paper review

Title: Methodologies for Expressiveness Modeling of and for Music Performance

Author: Giovanni De Poli

Reviewer: Jie Liu

This paper talks about the methodologies used in many models what are about music performance. The author classified those models into 'for' and 'of', which impress me very much because I think this classification is reasonable and smart. Models of music performance are the models for understanding musical expression and are also called analysis models. Models for music performance are models that are able to produce musical expressions, and are also called synthesis models.

Firstly, the author talked about the basic issue on what computational models are used for and the expression communication in music performance. He mentioned that there is an assumption of most of the music performance models: an artistic activity can be, at least partially formalized. Also he mentioned that there are two kinds of models: complete model and partial model. The complete model tries to explain all of the observed performance deviations on the basis of the given data, but the partial model aims only to explain at the note level, giving a small and robust set of rules. From my point of view, I would say the artistic activity could only be partially, not fully formalized. So I am more convinced by the partial model than the complete model.

To create computational models for performance, we have to consider which kind of information to deal with and how we can represent and process it using a computer. The author said that the information in music performance could be three layers: physical information, symbolic information and expressive information. The physical information represents the information that could be measured, such as the onset time of notes. The symbolic information is the score information, such as the structure of the music. The information in the top level, the expressive information, is more related to the emotional content of the music, and also it is what we are most interested in the research of music performance.

In the next part, the author introduced how musical information is represented for modeling purposes. There are three parameters in expressive performance: tempo, loudness, and articulation. These parameters are modulated in performance based on a certain interpretation. The author gave a good review of the previous research of exploring the relationship between the actual tempo in performance and the ideal in the score. In terms of the measurement of the onset time, he also suggested that the progress of computational analysis techniques should provide useful and standardized tools for performance parameter detection. However, he did not mention the loudness and the articulation very much. I agree with his opinion that the research of music performance should focus on explaining the systematic deviations: where, how and why a performance modifies the information indicated by the notation in the score.

Then the author talked about the models for understanding performance. He listed five kinds of models: analysis by measurements, analysis by synthesis, machine learning,

case-based reasoning and expression recognition models. For each of the above five, he gave several examples from previous research. I would say I am convinced by the first two modes: analysis by measurements and analysis by synthesis, because I think their methods are basic and direct, and they are not involved to much artificial intelligence staff. I think the machine learning method is worthy to try but the results might be too fuzzy to be accepted. In terms of case-based reasoning, as the author mentioned in the paper, it greatly depends on the availability of a large amount of well-distributed previously solved problems, which are not easy to collect. Although sometimes these two AI methods can produce plausible results, I don't think they have a good future.

Next the author discussed the models for music performance, which create performances. He said that the idea of automatic expressive music performance for classical music is questionable, because some artistic aspects of this kind of music will be omitted. I totally agree with that because currently I could not imagine that a computational model can produce a masterpiece. I can only expect a somewhat reproduction of a specific performance, and this reproduction is feasible for the purpose of education or entertainment, which is coincided with the opinions of the author in this paper.

The author used one section to talk about the models for multimedia application, more specifically, the interactive performance model. He mentioned that the expression could be conveyed by a joint action of the user and of the model. He also proposed two classes of interfaces: the graphic panel interface and the multimodal interface. The first one is to display the expression variables directly, such as tempo and loudness, and people need to learn how to control them. I think it is like speedometer in ESP and people need to learn how to drive the car. The second one is to let people act freely and the interface needs to learn how to analyze and identify human intentions correctly. I think this functional interface could supplement the future ESP development.