A training system not to drop a full piano performance by replacement of notes referring to the degree of proficiency

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A person who takes piano lesson has opportunities to perform the piano in a concert. It is ideal that he/she does not make a mistake in such a situation. Therefore, daily training is very important. In the piano training, we take some steps. The first step is basic training. In the basic training, we use musical score called “HANON”. The second step is repertory practice. In this practice, we learn musical expression through performing the musical score of repertory. Recently, various piano training systems have been studied and developed using MIDI musical instruments. These systems treat above-mentioned two steps. However, the performer cannot obtain an ability to avoid cessation caused by a performance error through these training steps even if he/she uses these systems. In the piano performance, cessation is a critical error. Such a situation is emergency state of the piano performance at the concert. In the Aerospace field, there are not only ordinary training but also emergency training. The emergency training is very important to escape from crisis situation.

In this thesis, I adopt this idea into the piano training and I propose a system for training against the emergency state by replacing some notes to make a pianist upset. The player can train to escape from the emergency state by using this system. I named this system “Apollon13”. Appollon13 simulates the state of emergency in the piano performance, say an accidental performance error. For this purpose, the system replaces a note like a real mistake.

The timing of note replacement is decided by a performance estimation algorithm. By the algorithm, the system searches the part where the player is apt to feel panic. Thus, Apollon13 aims to be an effective training system by note replacement in effective timing.

The system has 2 types of operation mode. One is a practice monitoring mode. In this mode, the system tracks performance. And it records performance. The other is a rehearsal mode. In this mode, the system decides the timing of note replacement by the result of the performance estimation obtained with the practice monitoring mode. And the system replaces a note at the decided part in the score. The system uses a score tracking technology of FamilyEnsemble[4]. The result of the performance estimation depends on the stability of the performance.

In the preliminary experiment, I inspected the difference of influence on performance by selecting the note replacement timing based on the performance estimation algorithm. As a result, the subjects adequately got panic by deciding the note replacement timing based on the estimation algorithm. In the evaluation experiment, I inspected the effect of continual use of the system. From the experimental results, the subjects came not to feel panic even if the note replacement occurred after they used this system several times. Therefore, it can be said that the emergency training is successfully achieved by using this system. In the evaluation experiment, however, the estimation algorithm actually could not find out the note replacement points where the subjects surely get panic. Hence, I examined estimation algorithm by comparing with player’s subjective assessment using the data of the evaluation experiment. As a result, there is relativity in subjective assessment and obtained panic parts. This result suggested that the algorithm would become able to detect the panic parts by approximating to the subjective assessment.