http://dx.doi.org/10.14236/ewic/EVA2016.38

The System of Graphs in Music Harmony: A user interface for mobile learning game development

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1. INTRODUCTION

The development of the information society and especially the development of the game industry changed the paradigm of the learning process (Tham & Tham 2012). The aspiration to find the form of knowledge representation which could maintain a large amount of information on the one side and the attempts to make the perception of the learning material as easy as a game on the other side poses the problems of its practical realization.

2. ORIENTED GRAPHS IN MUSIC HARMONY

One such appropriate form of knowledge representation is an application of the graph theory and the notion of a frame. The system of oriented graphs as a representation of the frame was built in music harmony to represent all possible passing progressions in one organized and clear structure (Shvets & Desainte-Catherine 2015). This system is a mind map in music harmony, which allows representing a large amount of information in a compact visible form.

3. PRACTICAL APPLICATION OF THE SYSTEM

The system of graphs has been previously used in music analysis and composition being implemented in Android applications (Shvets 2015). The success of the system application in harmony learning using web environment (Pistone & Shvets 2014), led to the exploration of its possibilities in a mobile game application context. Comparing to the implemented series of web applications the mobile version of the system implementation is featured with advantages which Android OS platform grants, such as a rapid switch of activities, the use of gestures and device movements. The rules of the game imply that after the graph triad has been selected from the main activity, the game activity is started, playing one harmonic sequence from the given graph triad. User needs to figure out which chords were played and place them correctly using chord items. The application counts the points for the correctness of the chords choice. Such mobile game application could serve as an interactive tool for ear training in off-class learning activities of students or as a supporting learning tool in distance education.

4. REFERENCES

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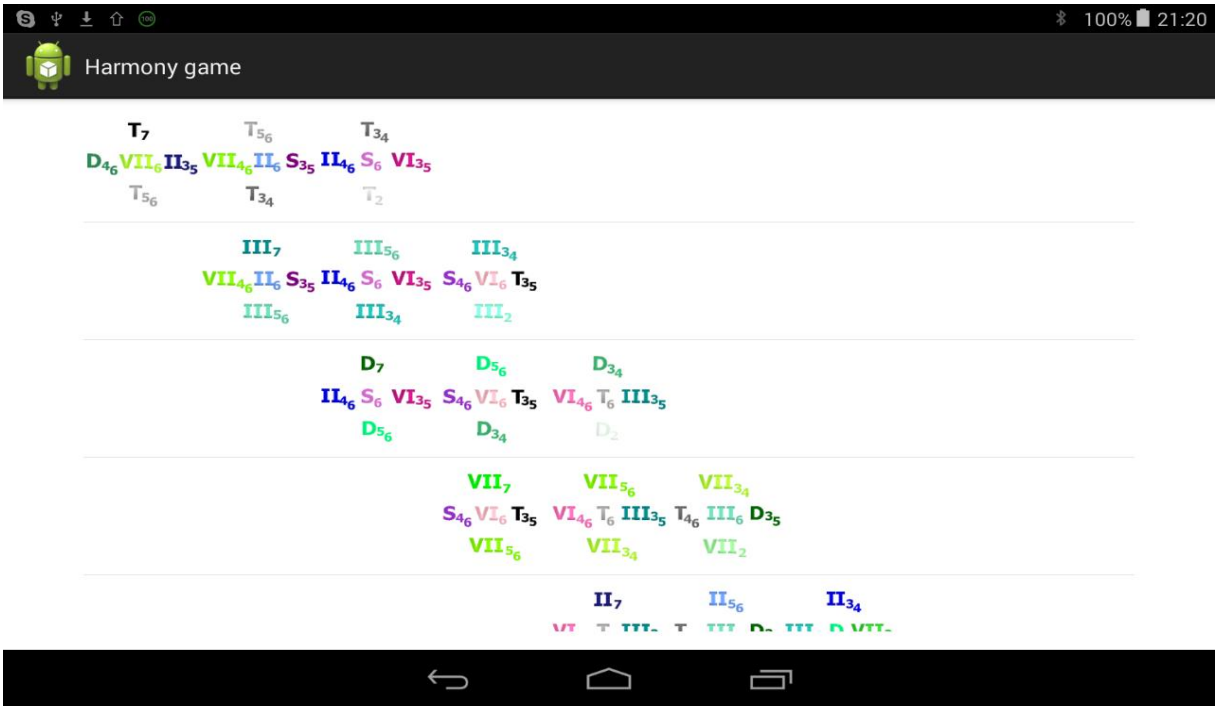

Figure 1: *Screen-shot of the application's main activity.*

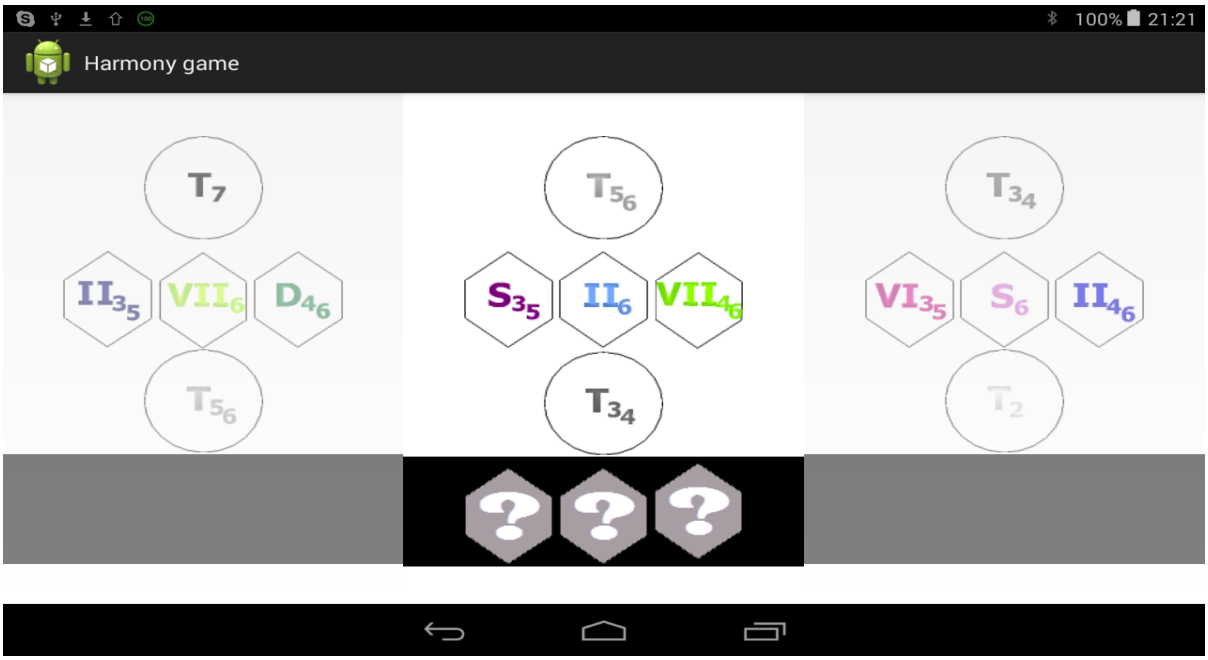

Figure 2: *Screen-shot of the application's game activity.*