A Review and design methodology of preserving piano playing techniques through contactless sensor fusion system

Abstract

The art of planning the movement of hands in order to produce the desired sound of the piano is one of the important part of piano technique. Different types of sensors have been used in order to capture motion data of piano playing. However, one area in this research had been under-represented, which is finger position and pressure measurement applied by the musician while playing the musical instrument. Research that embark on this area faced a common problem, the sensors used in these research are directly in contact with the pianist, which causes a change of piano playing experience. Because piano playing consists of very delicate interaction between the pianist and the piano, such change of experience may affect the pianist's performance. These sensors are considered to be intrusive to the piano playing experience. Concluding the challenges faced by current technologies, the proposed solution for this problems should meet few a criteria. The proposed sensor system should be a non-intrusive sensor that remotely monitors the finger and arm position of a pianist. The proposed sensor system should also able to investigate the strategy of finger positioning and arm motion of virtuoso pianists. Since each pianist plays the piano differently, this system could be used for storing and preserving a pianist piano technique. The data of the professional pianist could be shared easily through the internet, users will have access to the information about the technique of a famous pianist, which will provide good references for their piano learning. Furthermore, a piano technique demonstration from teachers could be stored for the use of their students. The stored data could be reproduced by robots performing on an acoustic piano, potentially recreating the same atmosphere of a live piano performance.