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Abstract
This thesis is intended to apply the techniques of MIDI and intelligent learning to implement an intelligent automatic guitar accompaniment system that utilizes the automatic guitar that we have designed before. Based on practical considerations, two modes will be provided by the proposed system. In the first mode, the user should play his desired tempo through a MIDI instrument connected to the computer. After that, the user can now properly define the time schedule of the corresponding accompaniment in the presented software interface. For the second mode, there will be two processes, learning and recalling, so that the proposed system can follow the user’s tempo. In the learning process, the accompaniment system will play automatically and intelligently, completing the learning process according to the user’s performance. While in the recalling process, the proposed system can predict in real-time the time interval of the subsequent musical note based on the results of the learning process to be able to make an ideal accompaniment system. To accomplish the above proposals, we have designed an efficient Neural Network to enhance the learning efficiency of the system. Some important inputs with special messages are added to the Neural Network that yields satisfactory results. We deeply hope that this musical robot project can not only improve the design techniques in Electrical and Mechanical Engineering Field, but also promote the unification between the Art of Music and Technology.
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