

Pedal Board Approach to Sound Effects Customization

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Introduction

In music sphere, it is recurrent the exploration of new sonorities through the treatment of sound signals with the use of equipment such as pedals, a device that allows to make several changes in the sound signal.

With the advent of applications such as digital audio signal processing systems, software which simulate pedals and other equipment used by musicians, present an attractive alternative because of the possible economic viability inferred. Based on this, we propose in this work a solution designed to run on a PC running Windows operating system that aims to be used with ease and flexibility in accordance with the necessity of the user, since it allows the user to encode, use third-party sound effects and other VST (Virtual Studio Technology) plugins or load the application as a plug-in in a DAW (Digital Audio Workstation) software. In addition, the proposed solution is open source, free and able to process guitar, bass and other instruments.

Related Solutions

This section presents a brief review of some software related to the software proposed in this work. Some software reviewed were: GNUitar [4], CP Guitar Effect Processor [2], Amplitube [1], ToneBytes Pedals [8], Rakarrack [7], DK Guitar [3].

The solutions in [1] and [8] simulates studio pieces of equipment such as racks, pedals and amplifiers, both are oriented to process guitar and bass sounds. Although [8] works with the same principle of [1], it does not simulate actual models of studio equipment. The solutions in [2], [3], [4] and [7] simulate most of the audio effects used by

guitar players, unlike [1] and [8], they do not simulate equipments.

The solutions reviewed has a free license for usage, yet, only [2], [3], [4] and [7] are open source solutions.

Proposed Solution

In this work, we propose a piece of software which simulates a set of pedals composed of: compressor, volume, distortion, chorus, flanger and delay in which, during its execution, the user introduces the audio and the software processes it in real time.

To use the application, the user will need to connect its instrument to the input of an audio interface (connected to the computer via USB). In the output interface, the user can use a headset or an amplifier.

When starting the application, it will be displayed to the user a set of pedals with the sound effects mentioned before, which it can be used individually or chained. Figure 1 shows the application feature screen.

As shown in Figure 1, the application shows by default the group of effects previously cited, however, if the user is interested in some sound effects not available in the default configuration, it is possible to create it using the APIs: Pyo [6] and WxPython [9] or the third-party audio effects plugins.

By pressing the “OFF” button, a pedal is activated. To use more than one pedal (sound effect), the other pedals simply need to be activated and the sound will be chained.

It is still possible to notice in Figure 1 that each effect has its own attributes whose intensity can be controlled by knobs. In the case of the chorus effect, for example, its attributes are feedback, depth and balance.

In addition, there is a sequence of buttons called “Swapping Effects” and below it, there are other two buttons, one’s function is to save some preset configuration and the other to load some preset configuration.

The first sequence of buttons cited allows the user to change the position of the pedals and thus change the sound chaining.



Figure 1: Software proposal for sound processing.

Final Considerations

In this work, we proposed a software in which, based on the applications presented in *Related Solutions*, simulates some of the most popular sound effects among musicians according with [5] and aims to be flexible by allowing users to encode your own audio effects, use third-party audio effects and load the software as a plugin in a DAW software. In addition, it was decided that the software proposed should have a simple graphical interface, be open source and free of charges.

For future work, a comparison of the proposed solution against the others mentioned in *Related Solutions* will be done to evaluate its usability and thus provide improvements in the user experience. In addition, it is also intended to facilitate the user experience who wishes to encode new sound effects through the dynamic addition of sound effects. Furthermore, it will be possible for the user to add sound effects to the pedal set making minimum changes in the source code of the project.

References

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