

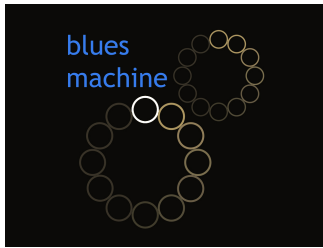
The Blues Machine

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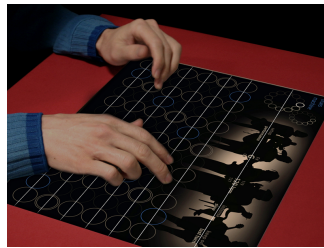
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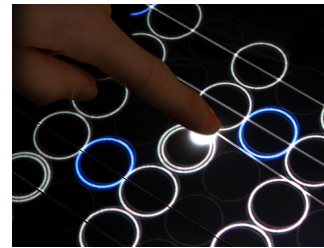
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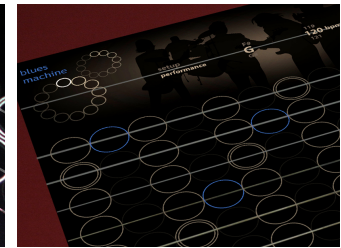
I



II



III



IV

1 Playing Computers

Hardware based musical instruments are, in general, from the performer point of view, merely copies of real physical instruments. They do not provide facilities for being played, especially for musically untrained people.

On the other hand, using computer software to simulate traditional musical instruments is a difficult endeavor too. Unfortunately, without special hardware components, the task of producing reasonable sounds becomes cumbersome, since mouse and keyboard were not designed to be interfaces for musical performance.

So, although computers are largely used in today's music production, we still can not *play* them, in the sense we play the guitar, for example.

2 Playing Blues

The 12-bar blues is one of the simplest musical styles: there are many songs built upon a scale of just six notes and harmonized by just three chords. That's why normally the guitar student starts improvising on the blues scale, listening to a 12-bar blues base.

However there is not a short way between learning the blues scale guitar patterns (there are five of them) and performing non-ramdomic improvisation. We can enumerate at least three obstacles: the first is that all of the five patterns differ from each other; secondly, many guitar notes are out of the scale; thirdly, shifting the patterns when the main chord changes causes global reference confusion.

3 A New Musical Instrument

Blues Machine (I) is a multitouch tangible guitar-like interface for 12-bar blues improvisation which aims to reduce the above mentioned difficulties.

It lies in between software- and hardware-based music performance devices. Exploiting multitouch technology, it circumvents mouse and keyboard limitations as musical interfaces. Mapping a guitar-like scale of notes on the screen and having real strings as performance guidelines (II), it resembles the real instrument.

With a multitouch interface the user can play more than just one note at a time, allowing more complex solos. With a tangible interface the performance becomes natural, decreasing the distance between the machine and the real musical instrument. At the same

time, Blues Machine simplifies the task of learning the scale patterns themselves. Notes in its interface's scale patterns are in one-to-one relation with those of the guitar patterns, but the matrix of notes in the Blues Machine is simpler: except for the blue one, notes are vertically aligned (III). Moreover, it's more difficult to play a wrong note, since there is no note out of the scale.

4 Engine and Interface

Blues Machine was developed with Macintosh's Quartz Composer. Quartz Composer facilitates dealing with images, but was not especially designed for sound synthesis, so a set of plug-ins had to be implemented in Objective-C. The composition receives finger tracking messages from *reactIVision*, a computer vision framework developed by the Music Technology Group of the Universitat Pompeu Fabra as part of the *Reactable* project ¹. Sound synthesis is done via MIDI, by Apple's DLS Synth Audio Unit. The composition and plug-ins are available at the project website ².

Blues Machine's interface (IV) has two main areas: backing track control and performance. The first, located at the top, receives five kinds of accompaniment instructions: global state of the machine (setup or performance), chord, tempo, backing track type and a control to terminate the song at the next turn. Improvisation is done on the performance area, whose design resembles a guitar fingerboard. All commands are guided by guitar strings, so that the user interacts with the interface in a (right or left hand) guitar-like movement. Even bends are possible (III); thanks to the string's physical limitation, the user perceives how far he can go with the pitch shift.

5 Habitat

We see three main scenarios where the proposed application can be used. The first and more obvious one is as an entertainment device. We believe people with no special musical abilities can perform self pleasing melodies with little practice. Blues Machine can also be used for teaching/learning purposes; its characteristics makes more effective the learning curve of a new musical scale. The last and more ambitious scenario is its use, after necessary adjustments, in live performance by expert musicians. And of course this applies not only to blues band musicians, since the idea of Blues Machine could be adapted to any other musical style.

¹<http://mtg.upf.edu/reactable/>

²www.visgraf.impa.br/bluesmachine