

# FeetJ: The foot-controlled DJing app

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## ABSTRACT

We propose a new kind of DJing interface that uses the Multitoe touch floor. Challenging the notion of DJs having to be trained professionals and well equipped, we reduced DJing to the most important tasks. Furthermore we focused on making those tasks as simple as possible, rather than copying traditional DJ tools.

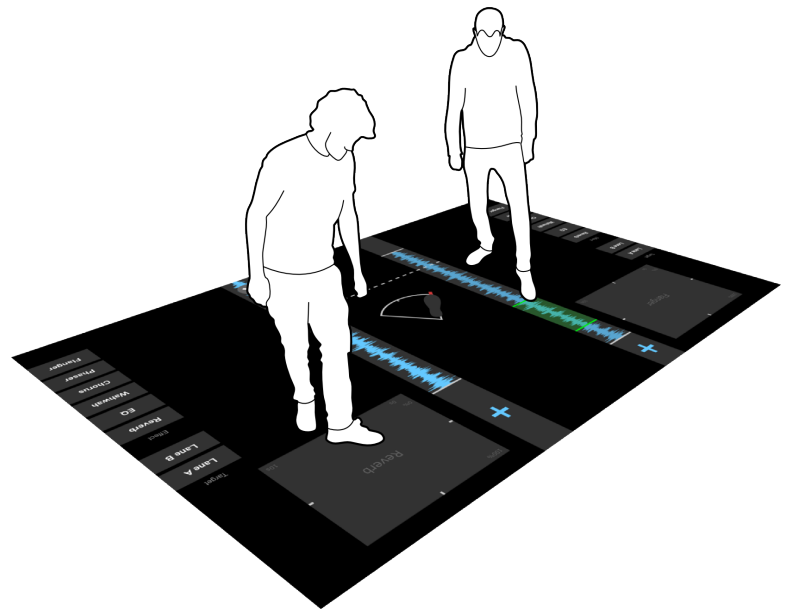
Our application enables up to three users to select songs, mix them together and apply live effects.

## INTRODUCTION

DJing is traditionally defined as a single person skillfully operating a multitude of dedicated DJ equipment. We set out to challenge this definition and started by researching what the actual essence of DJing is. Therefore we interviewed Berlin student and DJ Art Pelling.

We asked him what the core tasks of DJing are. Against our expectations he responded that the main thing about DJing is neither expensive equipment nor years of experience, but knowing and loving your music and having fun in sharing it with an audience: "You have to create a constant flow of music to keep the people dancing".

Thus we chose to build a DJ application that only focuses on those key requirements. Furthermore, we decided to outlay our system for multiple users, enabling them to mix music together. The size and the multitouch capabilities of Multitoe achieved our goal of

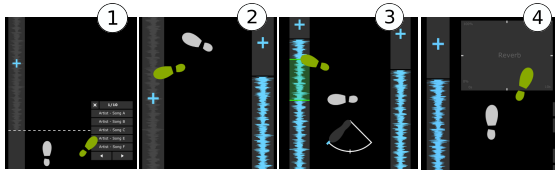


**Figure1: Two users combining DJing and performance using FeetJ on Multitoe.**

seamless collaboration of up to 3 users. Another advantage of Multitoe that we wanted to make use of is that it allows interaction with the whole body. This aides the DJs in conveying rhythm and atmosphere within their performance.

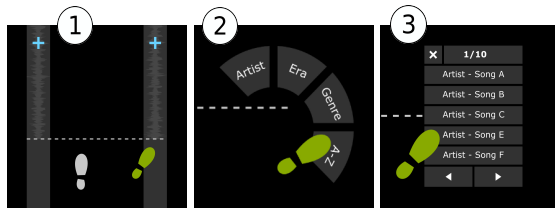
## WALKTHROUGH

Our scenario includes two participants named Lisa and Tom. They want to entertain their friends by playing a set of songs. This includes crossfading from one song to another and enhancing both of them with effects. Lisa is responsible for song selection and crossfading while Tom adds and modifies effects.

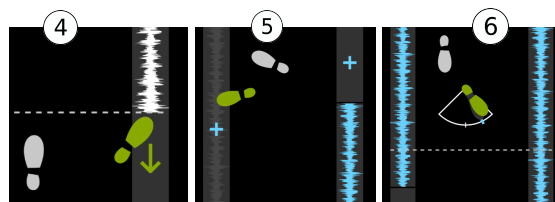


**Figure 2:** (1) Lisa adds a song by tapping on one of the song-lanes and selecting an entry in the popup menu. (2) She then starts to play the song and adds another in the second lane. While both songs are playing she can crossfade to the second one. (3) Lisa also interacts with the songs by looping and scratching. (4) In the meantime Tom can apply various effects to the songs.

We will now take a closer look at the necessary steps to accomplish the tasks:

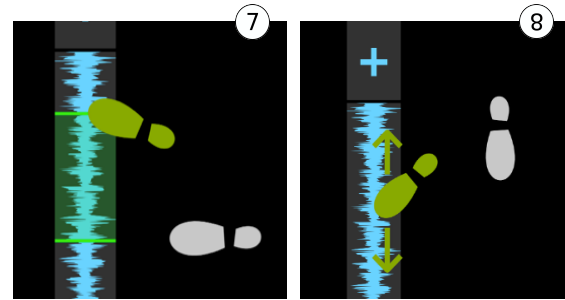


**Figure 3:** (1) Lisa starts by tapping on one of the song-lines to open the song selection menu. (2) Now she is able to filter her songs by artist, era or genre or show them in alphabetical order. (3) She can then choose a song from the list of most relevant songs according to her previous played songs and according to the filter.

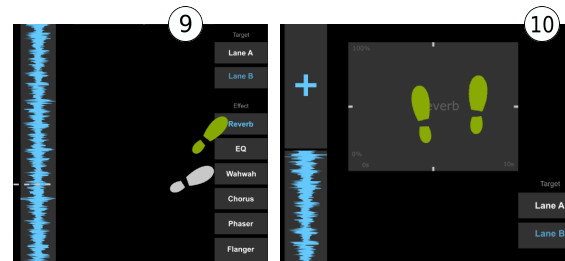


**Figure 4:** (4) The song will then get loaded into the song-lane and is ready to be played. Lisa starts the song by flicking it in direction of play. (5) While the first song is already playing Lisa adds another song to the second lane and starts playing it. (6) When she

wants to play this song she crossfades to it by using the rotary crossfader.



**Figure 5:** (7) If the song contains an interesting part she loops it by setting her feet on the start and end position of the loop. (8) She can also scratch by simply dragging the whole lane for- and backwards.



**Figure 6:** (9) In the meantime Tom can select an Effect. (10) By dancing on the control pad he can modify the effect.

## DESIGN

In the beginning of our design process we came up with two completely different interface design drafts. One of them was a more or less traditional DJ-UI based on well-known DJ-Tools like Native Instruments' "Traktor" or Atomix' "Virtual DJ", who employ many buttons and use a lot of clicking/tapping.

The second approach was building a completely new interface from scratch, using the key advantages of the floor, especially its multitouch capabilities and size. We wanted to create new concepts of interacting with music and other users.

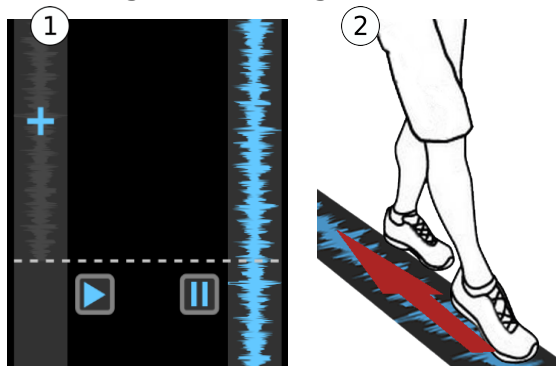
Top goal for this approach was to create an interface that is discoverable to make it fun for first time users.

During Paper Prototyping we worked out that most users did not have experience with traditional DJ elements and felt uncomfortable with the button-based approach. Three out of five testers told us that in their opinion it did not match the concept of the floor. The second approach worked significantly better for the participants.

## Gestures replace Buttons

### Starting a song

Our first design for playing a song was a simple Play-Button that changed into being a Pause-Button, when the song was playing. Even though it's a well-known concept it got confusing for our Paper Prototype participants. Many participants simply forgot to start the next song before fading into it.



**Figure 7: (1) Play- and pause-button; (2) flicking-gesture to start a song**

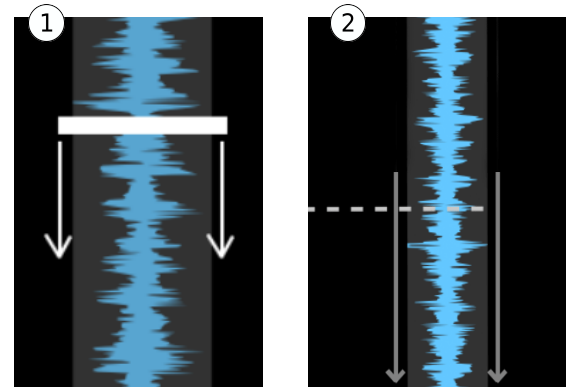
Just telling the participants to use gestures and try to find out which there are gave us great insights on how users would expect a gesture based DJ-UI to work. Our idea to flick a song into the playing direction to start it was discovered by four out of five users.

### Indicating a song is playing

To support the idea of flicking a song, we chose to let the whole song-lane move towards the DJ, having a global

and fixed line that indicates the current position of the song.

The other option was letting a marker



**Figure 8: Two ways to show the current song position: (1) a moving marker; (2) the whole lane is moving.**

move along the lane showing the current playing position. This forced the DJ to move along the lanes quite a lot. Most of the participants preferred the moving song-lane with the “cockpit”-view.

### Removing a song

Another important issue was how the DJ can remove a song. Using a button for this never seemed to be a good idea.

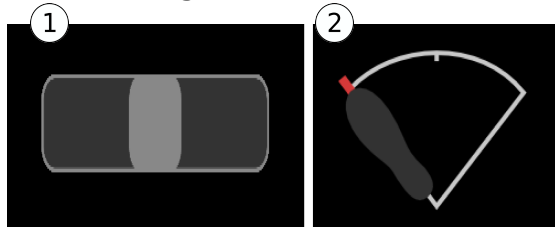


**Figure 9: Flicking-gesture to remove a song**

We based our gesture on guessability-information gained during Paper Prototyping. Two users directly tried to push the whole lane away from the “cockpit” (1). The others were able to guess it quickly.

## Heel-Turn-Crossfader

Crossfading is one of the main tasks and requires a lot of timing. Thus, users must be able to reach it quickly and operate it precisely. Our initial idea was to use a draggable slider to crossfade between songs.



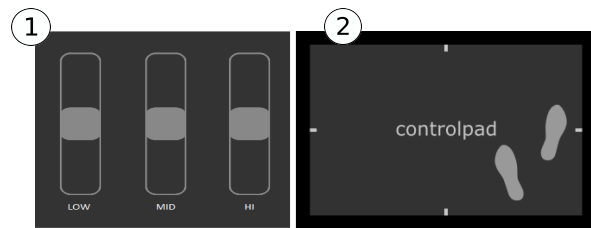
**Figure 10: Alternatives to crossfade: (1) A basic slider; (2) a crossfader operated by turning a foot on it.**

During paper prototyping testers had no discoverability issues. On the other hand they claimed it was difficult to create smooth transitions. We then came up with a gesture-based crossfader that could be used by turning your foot on your heel. Due to the fact that dragging a slider with a natural movement is more comfortable than simply dragging a slider horizontally, participants preferred the heel-based variant.

## 2D Effect Control Pad

Adding effects to songs is an important part of DJing, especially when making transitions between songs. Effects can be used to enhance the sound of a song as well as removing certain frequencies, allowing smoother fading. They can even be used to “remix” songs by playing two altered songs simultaneously.

Initially we used sliders and rotary knobs to control the parameters of each effect. Those controls were very difficult to handle with feet. It also was unspectacular and not very pleasing. Therefore we implemented a rectangular interactive control pad,



**Figure 11: (1) Faders to control parameters of effects. (2) a controlpad with one parameter on each axis**

with each axis controlling one parameter of an effect. So the user can change the sound of the effect by dancing on the control pad.

## CONCLUSION

Using Multitoe offers a lot of new functionalities and exciting possibilities for DJing applications.

Having multiple users collaborating on the same floor was appreciated by participants and turned out to be one of the key abilities of the floor.

We also discussed about how much functionality we want to offer. On the one hand there’s still a lot of potential for new features like layering multiple tracks, introducing new effects. On the other hand every bit of additional functionality would have made our interface more cluttered and ergo less discoverable. In this trade-off between functionality and simplicity, we decided to stick to the basic features to make FeetJ as discoverable as possible for first time DJs.