ETH zürich

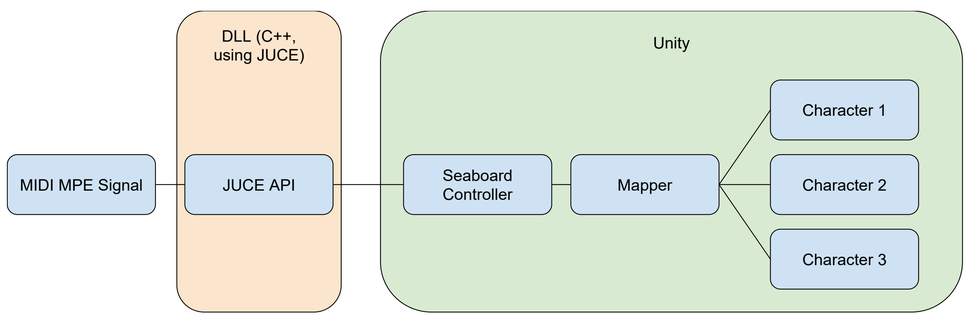
igl INTERACTIVE GEOMETRY LAB

Real-Time Animation with a Seaboard

Abstract

Animating characters (in real-time) is a complex task. We explore how a digital music instrument, the Seaboard, can be utilized for real-time animation. We describe the technical setup and the challenge of implementing sensible mappings that allows users to get used to the interaction quickly and perform on the surface naturally, while still being powerful enough to control one or multiple characters and their surroundings with many parameters.

Method

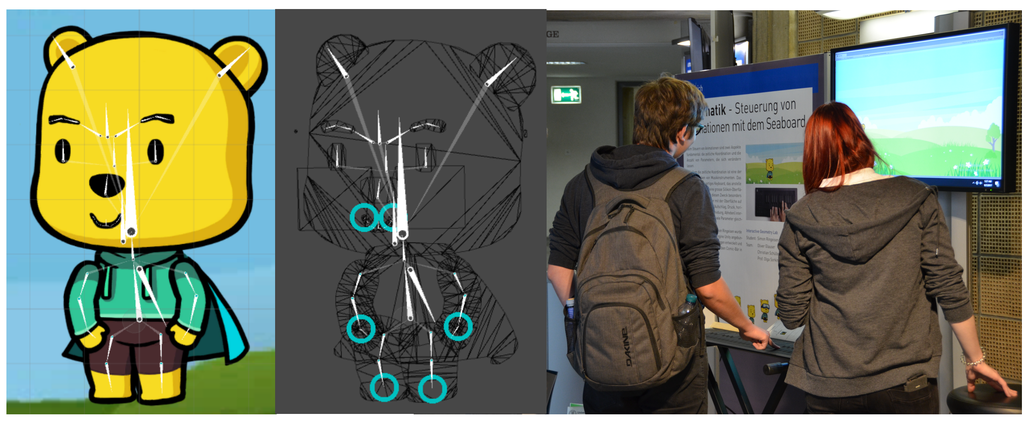


Technical Implementation:

To connect to the Seaboard and decode the binary data we rely on JUCE. As JUCE is written in C++ and we use C# in Unity, we need to connect these two languages with each other. We used C# Marshaling for this, offering external C-style functions in a C++ DLL to link to the instrument. In Unity we import these C-style functions from the DLL and setup the callback functions using delegates. We implemented a SeaboardController, which establishes a connection with the DLL and fills a local data structure with the currently played notes on the Seaboard using the aforementioned delegates. The currently active notes (interactions) are stored in a Dictionary and further the Controller offers the possibility to listen to changes, again using callback functions. This allows the mapper to implement a state based, event based or combined mapping. The mapper finally connects to the character and changes parameters to contoll the animation.

Mappings:

The Seaboard provides users with a plethora of input parameters: if all ten fingers are used simultaneously, 30 continuous, 10 initial and 10 ultimate parameters can be modified. We distinguish key-based (where we look at keys as separate objects), area based (where we group several keys together) and gesture-based mapping. Key-based mappings have the benefit, that they are very easy to understand, but it can be difficult to control many different parameters simultaneously. Area-based mappings allow to combine some fingers together to change more parameters at the same time, but they are much harder to learn. Gesture-based systems can help to solve this problem, but different persons use very different gestures to describe a movement, which makes a learning system necessary.



Conclusion

We set up a small test, where we present a person with three different mappings, give some time to learn them and then ask to animate a character in a certain way. Most of the participants liked the idea of using the Seaboard as a tool for animating and had lots of ideas, how the character could be extended to do different things. Users were confused very fast, when the setup did not produce the animation, which they were expecting. This partially lies in the missing ability of the Seaboard to give any direct feedback. Concluding one can say, that the Seaboard is a suitable device to control animations in real-time, but as with any instrument, the user needs times to learn it.

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