Gliss: An Intuitive Sequencer for the iPhone and iPad

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ABSTRACT
Gliss is an application for iOS that lets the user sequence five separate instruments and play them back in various ways. Sequences can be created by drawing onto the screen while the sequencer is running. The playhead of the sequencer can be set to randomly deviate from the drawings or can be controlled via the accelerometer of the device. This makes Gliss a hybrid of a sequencer, an instrument and a generative music system.

Keywords
Gliss, iOS, iPhone, iPad, interface, UPIC, music, sequencer, accelerometer, drawing

1. INTRODUCTION
Gliss is an intuitive music sequencer, which lets the user create and perform music.
Sequences can be created by drawing onto the screen which can then be performed by tilting the device. The x-axis of the accelerometer controls the position and speed of the playhead, while the y-axis can be used to randomize an offset for each drawing. Thus drawings of sound can be performed in an intuitive physical way.

The idea of developing this app came while developing a prototype 16-step sequencer for the iPhone. Apart from the number of existing apps that implement quite sophisticated step sequencers, I was searching for a way to create loose and not quantized sequences, which could be interpreted in different ways. Using the accelerometer as unique feature of mobile devices we added the ability to scan back and forth through sounds on a time line and thus make it possible to approach a sequence literally from different angles.

2. BACKGROUND
The method of drawing sounds on a timeline has been explored by Iannis Xenakis with his UPIC (Unite Polyagogique Informatique du CeMaMu) system in the 1970s. The UPIC was a hardware device, which allowed the user to draw sound events, which were then synthesized by a computer. Since then a few other programs have been developed based on drawing sound. [4] [6]

Xenakis' UPIC system included an option to specify the amplitude over time. Such a feature has not yet been implemented in Gliss, mainly for the reason to keep it simple at the current stage of development.

Other approaches of using drawing for music creation include the installation and iPhone app Sonic Wire Sculptor by Amit Pitaru and DrawSound by Kazuhiro Jo. [2] [3] In contrast to Gliss these two systems not based on a straight timeline. Although Sonic Wire Sculptor does implement some kine of three dimensional timeline, it will produce sound while the drawing is still being made. DrawSound is not based on a timeline at all, but translates drawings immediately.

Gliss provides a facility for composing a piece with different section and performing it, which turns the iPhone into a musical instrument. Using the iPhone as an expressive musical instrument has been inspired by the work of MoPhO (Mobile Phone Orchestra). [5]

The option to randomize the x-position of the drawings by a tilt injects ideas of generative and algorithmic music into Gliss. [1] Though there is currently no method to let the Gliss app generate new events automatically, the simple mechanism of physically controlling a random frequency offset can turn it into a generative system.

In comparison to other generative music apps, Gliss tries to give the user more control over the musical outcome while still keeping a certain playfulness. By providing a general framework to create composition which can be performed by others it can be seen as a step towards mobile music as an emerging form of creating or listening to music which asks for physical action and will never sound exactly the same.

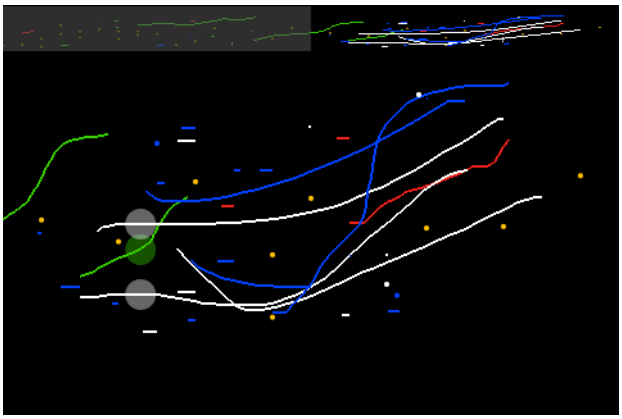

Figure 1. A screenshot of Gliss' main screen. Each color represents a different sound.

3. DRAWING ON A TIMELINE
Gliss has one main screen, a timeline, onto which sounds can be drawn in five different colors. Currently one can choose from three different instruments: a sound file player with variable playback rate, a sine oscillator and a sampler which assigns the y-axis of the screen to different samples rather than

to pitch. Samples and sound files can be loaded into the application via wifi or the internet (using SoundCloud, a commercial service to host and share music files). Contrary to most other sequencers currently available for mobile devices, Gliss is not based on a time grid. The placement of sound objects does not have to be quantized, sounds can be placed freely in time. However, there is an option to use a grid if a stricter rhythmical sequence is desired. This set-up allows a far more experimental approach than those offered by other sequencers, which are mostly designed for the creation of beats and dance music.

All sounds are placed overlapping on one screen, which means that there aren't any separate tracks for each color or instrument. Still they can have different ranges of pitch assigned to their y-axis. This has the advantage that one can easily have an overview of the sequence on small screens. Gliss works with project files, each of which can contain an indefinite amount of sequences. Each sequence can have its own samples, instruments and other settings, such as tempo. A piece can be performed by paging through the sequences.

4. PERFORMING SEQUENCES

Presently the app acts like a music sequencer. The special feature is that the playhead on the timeline and the position of the objects can be controlled by the movements of the hands.
Currently there are two modes to control the playhead: Via a fixed tempo, so that tilting the device changes the playback direction, or a physical behavior can be assigned, so that not only the direction but also the speed of the playhead changes according to simple, yet effective (virtual) mechanics.

A small button on the main screen lets the user switch between both modes. When pressing the button in 'physical' mode one can either freeze a certain speed in order to preserve the current tempo, or with a double tap return to a predefined tempo.

Another way of interacting with the composition is to randomize the y-position of the drawings. This feature can be toggled by a button in the main screen and controlled by tilting the device. Depending on the degree and direction of the tilt, the drawings after being played move to a new position within a random range. Holding the device flat sets a full range, so that the drawings can move anywhere on the y-axis of the screen. By changing the angle one changes also the range, resulting in objects more likely dropping towards the bottom. This creates randomness controlled by gravity. Similar to the tempo button, the current state can be frozen with a single tap or brought back to the original with a double tap.

5. CONCLUSION

Primarily the performing features in Gliss turn it into an instrument with which fixed composition can be performed and interpreted on the fly. Thus, when creating a sequence, one does not write or draw a fixed composition to be played back, but one rather composes some kind of prototype for a piece, which offers various variations one can listen to. Such method or style of music creation and reception could be described as Mobile Music, variable fixed composition which needs to be played on a mobile device. An important aspect hereby is that production, performing and listening happens on the same environment: the device and software.

Such a playful approach also attracts children who are often very open for experiments and shows them another angle of dealing with sound and defining music.

Gliss was also used in ensemble settings, where even untrained performers were able to play in a group.

For the more traditional producer it can serve as a sample and effects manipulation unit.

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