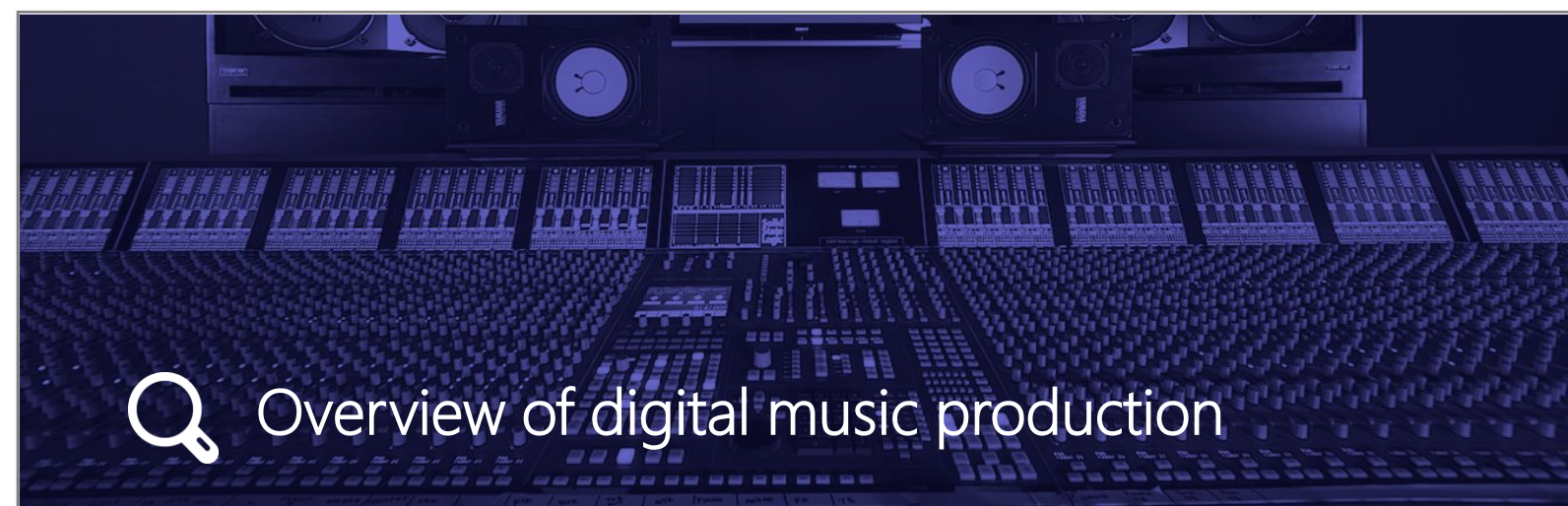


UMix – A Mobile Application of Music Production Tool

Designed by
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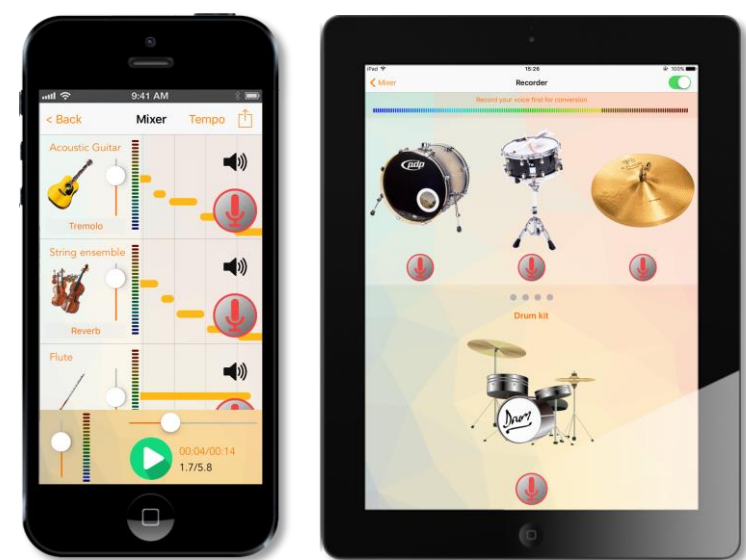
Overview of digital music production

Digital music production usually requires various hardware and software tools, like mixer, compressor, MIDI sequencer software, digital audio workstation (DAW) software and high-quality microphones. These hardware tools are usually non-portable and large in size, which are very inconvenient and costly to install. For software tools, they are not only computationally intensive, but also highly manual and non-intuitive in UI design, creating a steep learning curve for users.

Therefore, our group developed UMix, which is an iOS application providing straightforward, intuitive and innovative ways in digital music production.

New way to create digital music

Turn your voice to an instrument and mix it right on your smart device



Simple & Intuitive GUI

Easy-to-learn interface



- Native iOS interface
- Easy-to-understand music visualizers
- Intuitive editor with gesture recognizer
- Assistive pitch meter and amplitude views

Accurate audio processing algorithms

Convert your voice into either melodic or percussive instruments

Sing pitched notes and convert to melodic instruments (like piano, guitar and violin)

- Accurate pitch detection by smart double Fast Fourier Transform (FFT)
- Reliable vocal note segmentation using amplitude differential analysis



Figure 1: The pitch detection and note segmentation algorithms applied on an audio excerpt of a user singing the first part of the song "Joy to the World".

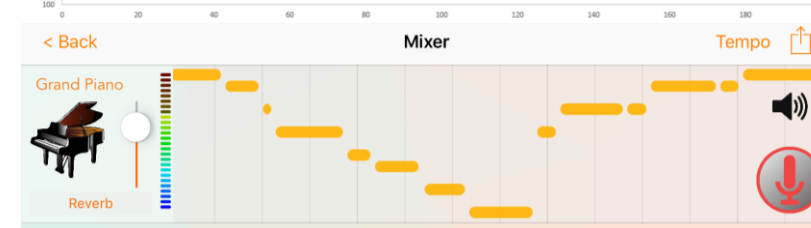


Figure 2: The MIDI channel notes data showing the result of the audio excerpt of Figure 1 on the MIDI sequencer visualizer GUI

Speak words with vowel and convert to percussive instruments (like drums)

- Accurate formant detection by Linear Predictive Coding
- User-dependent analysis using Supervised Machine Learning with k-means clustering

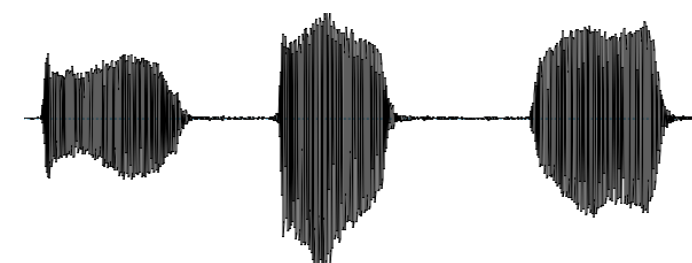


Figure 3: This is the waveform of an audio excerpt showing three spoken vowels including /u:/ /a:/ /i:/

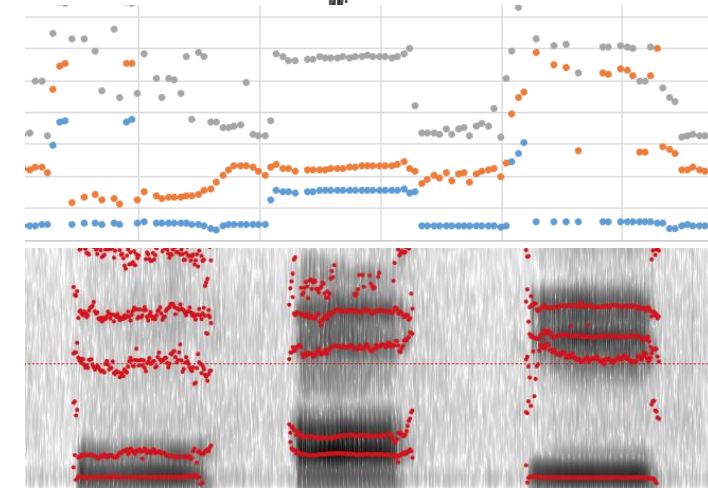


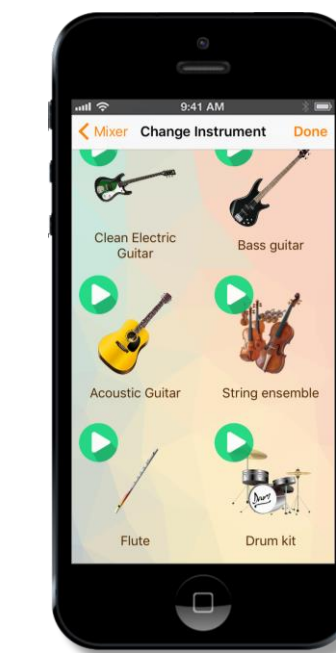
Figure 4: The analyzed formant data of the audio excerpt in Figure 3 using the above algorithms executed in our app directly

Figure 5: The analyzed formant data of the audio excerpt in Figure 3 using professional analytical software "Praat". It shows that our analysis is accurate.



Professional music studio on your smart device

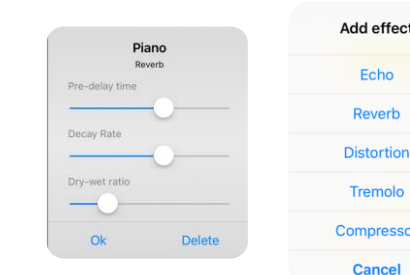
Offer professional digital music production experience



Digital Audio Workstation (DAW)

Provide most essential DAW functions

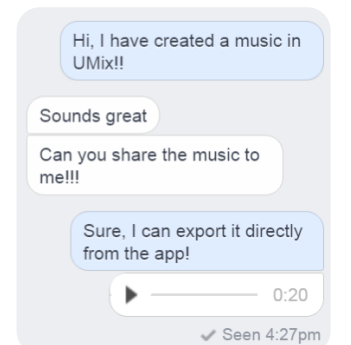
- Full-functioned multi-channel MIDI sequencer and player
- Low-latency real-time MIDI player playback for user preview
- Virtual instrument sound library of various instruments with realistic sounds, including Grand Piano, Acoustic Guitar, Classical Guitar, Electric Guitar, Bass Guitar, Violin, String Ensemble, Flute and Drum Kit.
- Customizable real-time audio effects, including echo, reverb and distortion, tremolo and compressor



Mix, export and share instantly

Share your music creation to your friends

- Export your mixed music into PCM or MP3 format
- Instantly share your music creation to external apps like AirDrop, Mail, Google Drive, Facebook Messenger and Dropbox



Compatible with
iOS 9.0+ device



Available on the
App Store

