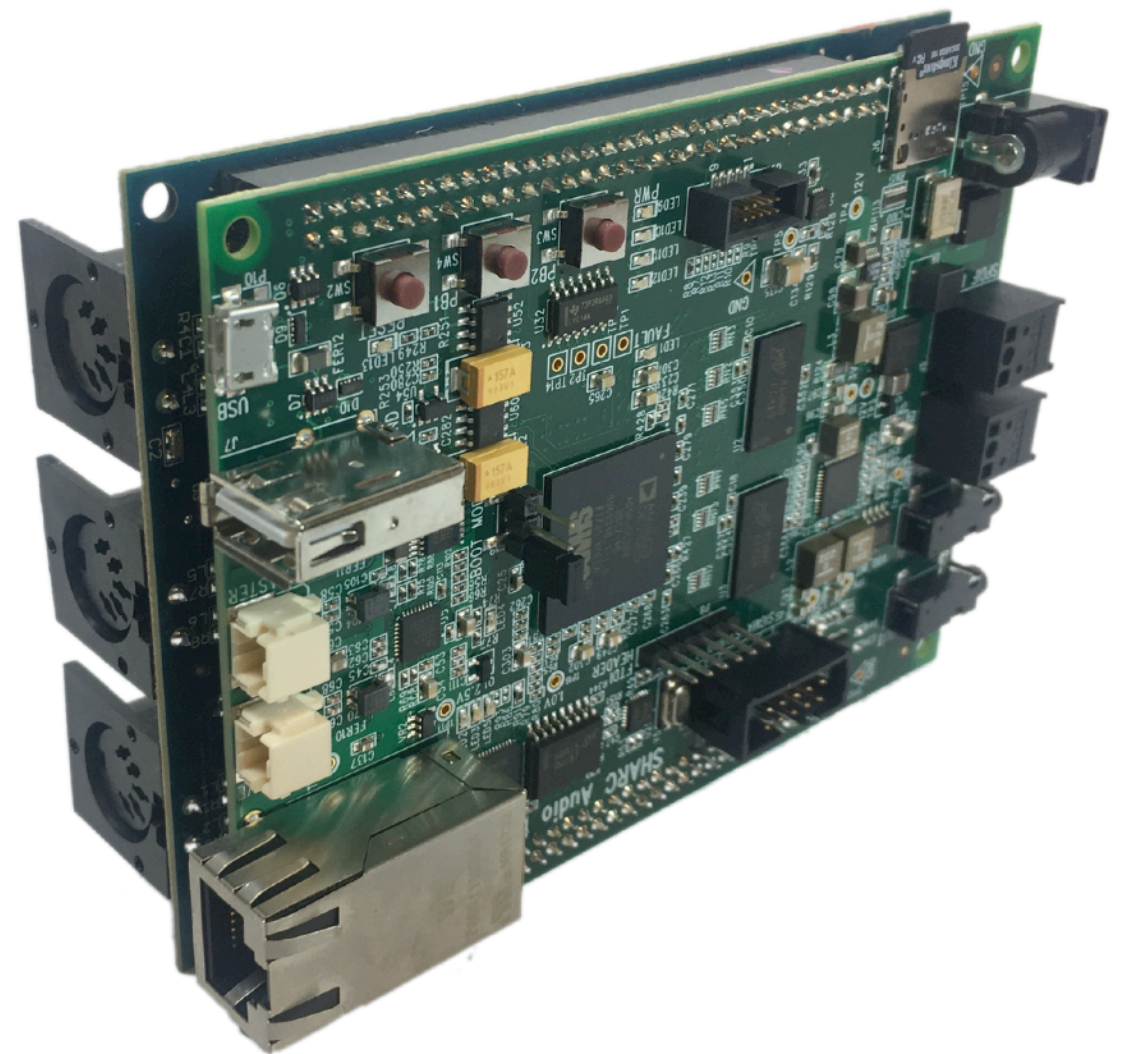


Using Faust for Development on the SHARC Audio Module

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A3E Workshop, NAMM 2019, Jan 26, 2019



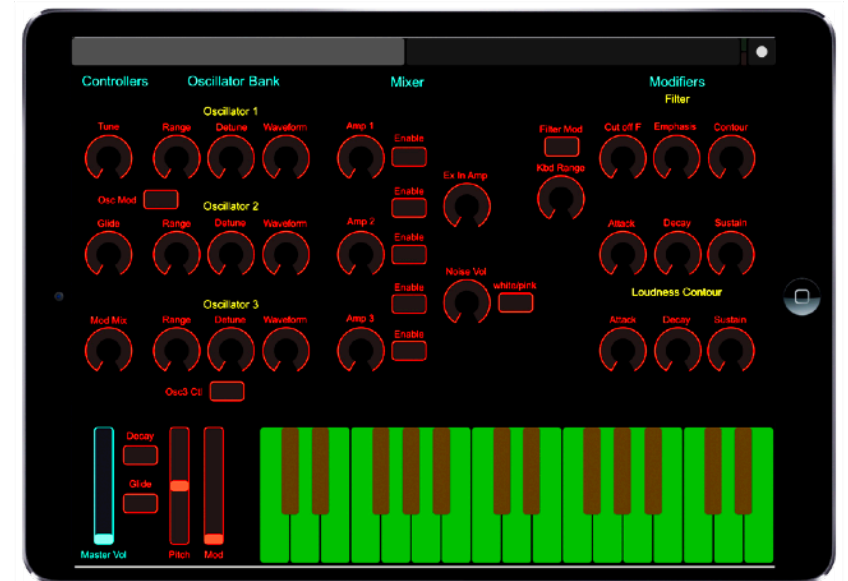
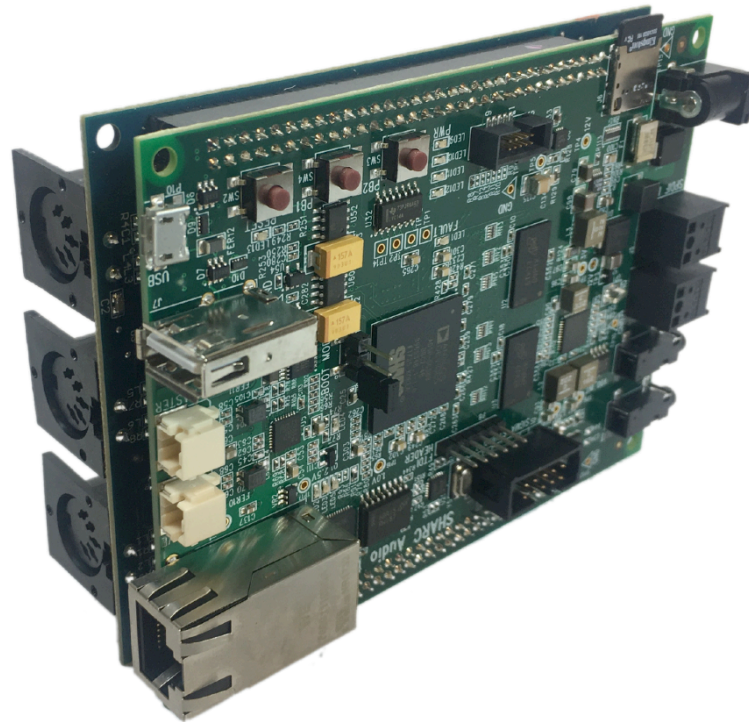
This presentation can be found at:

moforte.com/faust_on_sharc

Or contact me at gps@moforte.com

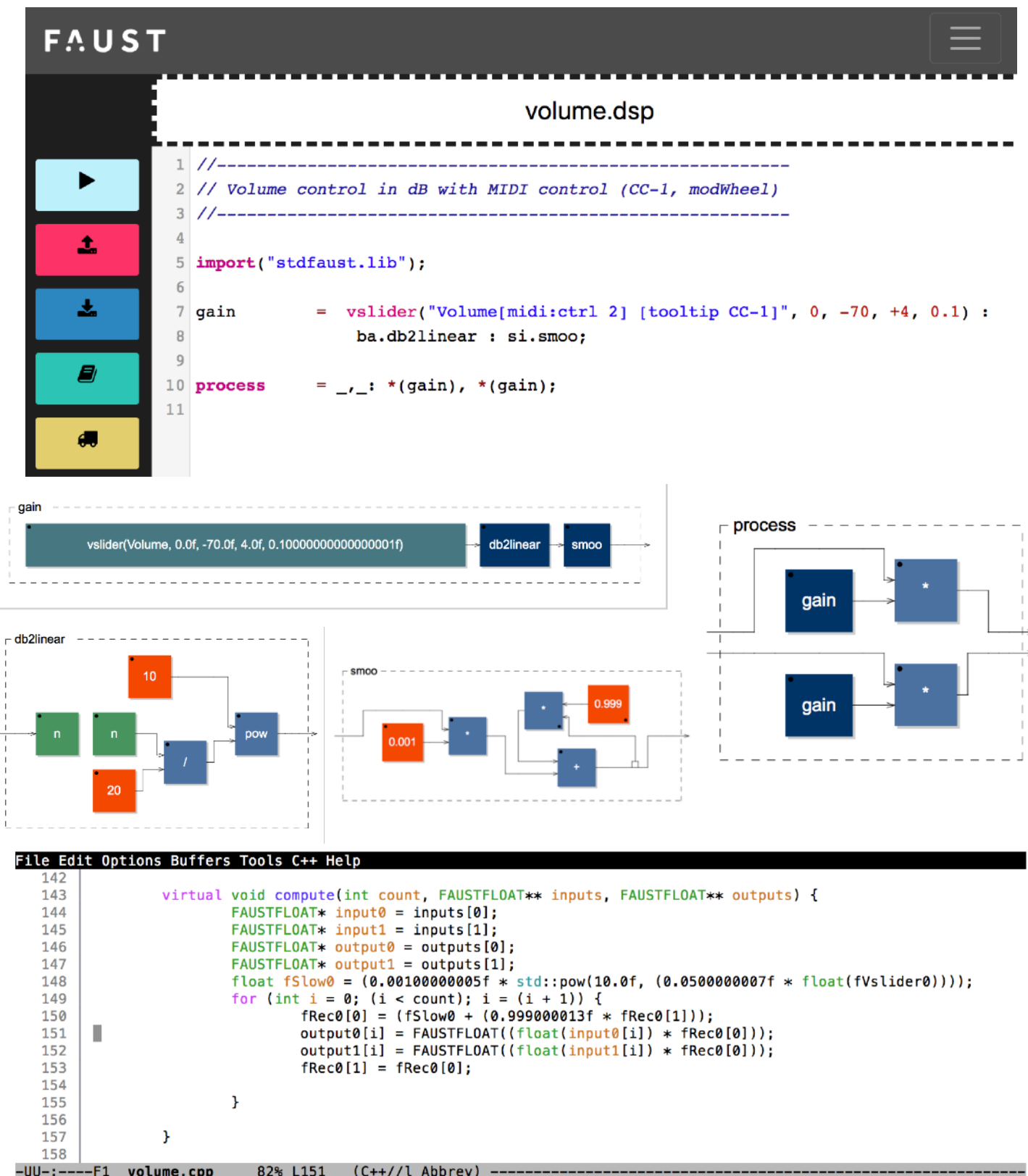
Where We Are Going?

A model of a classic analog synthesizer + effects, written in Faust, realized on the SHARC Audio Module, controlled wirelessly from a tablet



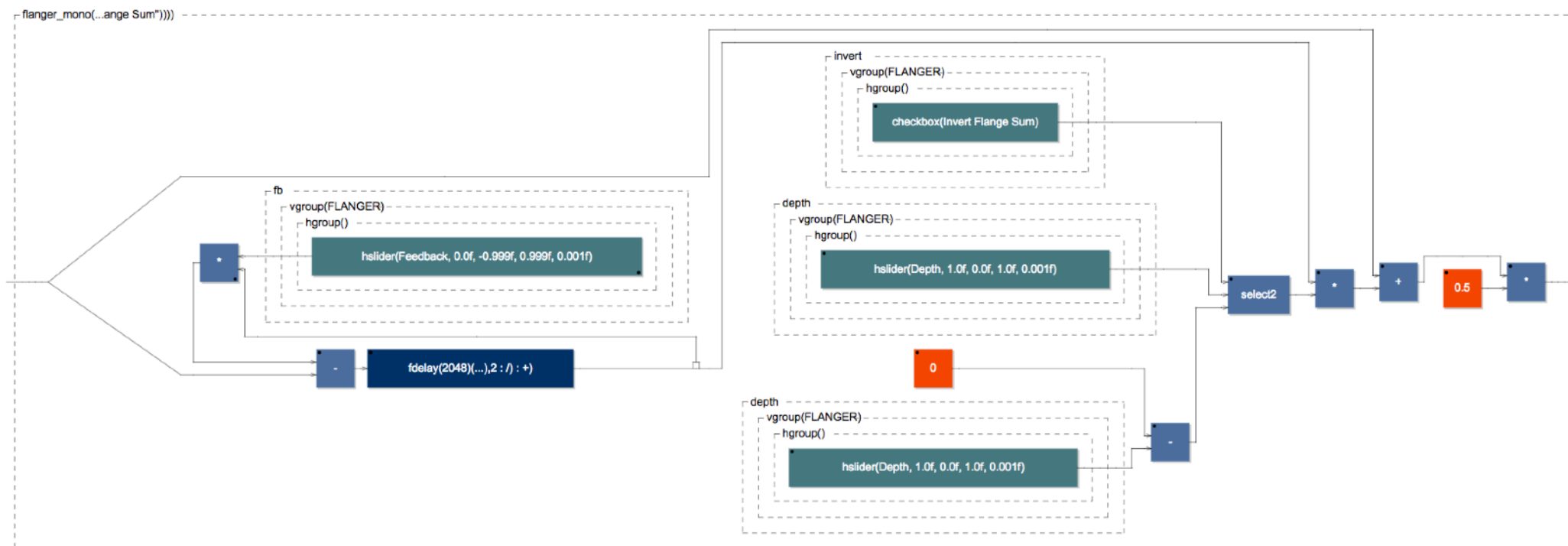
Faust

- Faust is an open source functional programming language specifically for real-time audio signal processing applications.
- Faust programs are translated into C++ and can be targeted to multiple platforms via an “Architecture”.
- The Faust library provides a rich set of DSP blocks specifically for audio processing
- The Faust distribution includes an “Architecture” for the SHARC Audio Module. Faust algorithms can be compiled and migrated into the Analog Devices CCES tool chain with an online editor or the **faust2sam** command.



About Faust

- Using Faust, it's possible to quickly develop large algorithms that take advantage of the computing power available on the SHARC Audio Module platform.



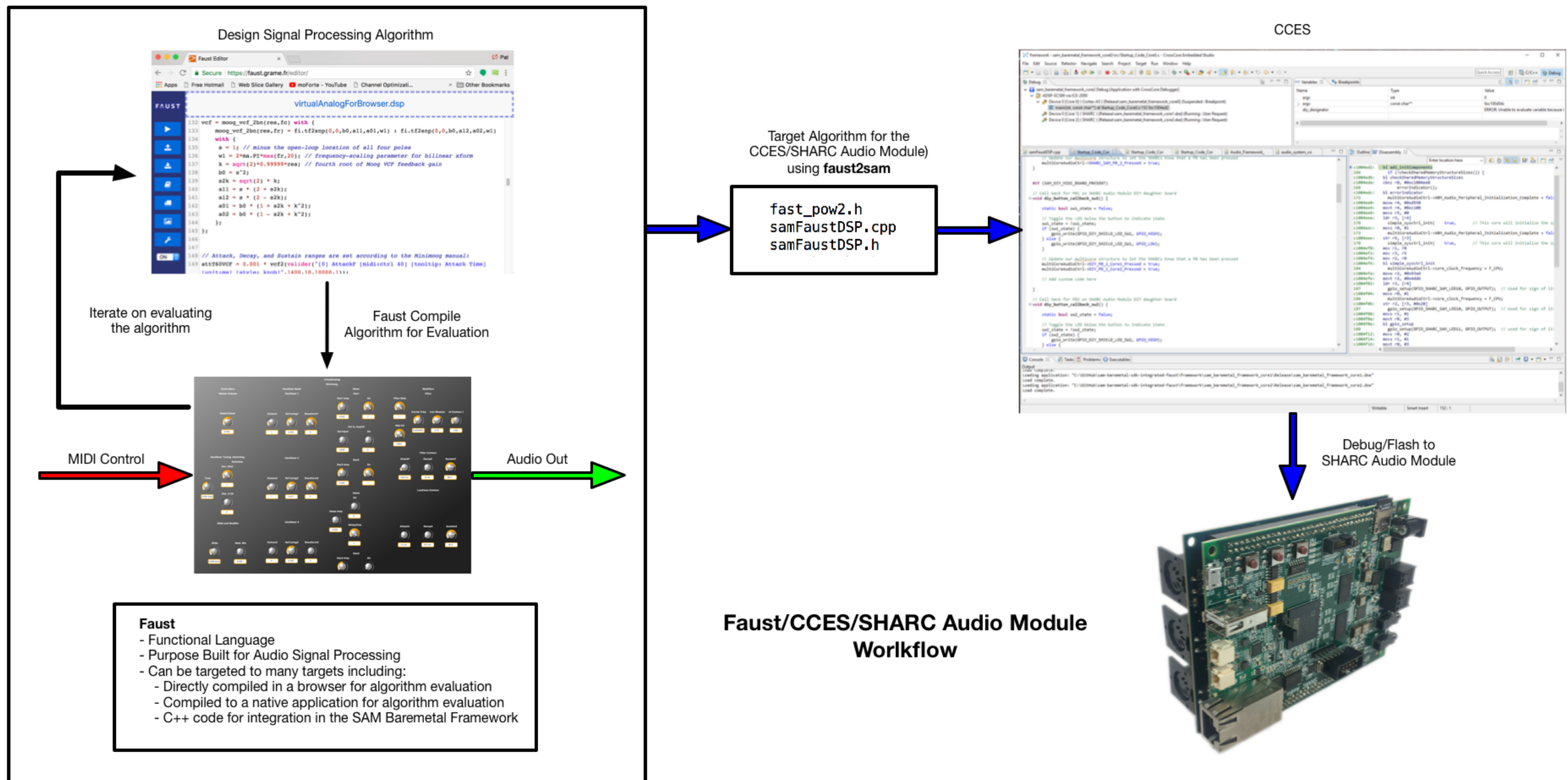
- Faust was developed at Grame University by a team of mathematicians: Yann Orlarey, Dominique Fober, Stéphane Letz, with significant contributions from Dr. Julius Smith (Stanford/CCRMA)

Faust is Used to Develop moForte's Products

- All DSP implemented with Faust.
- Detailed 6 string Guitar Physical Model.
- 22 effects processing units. Many effects are circuit level models (distortions, amp tone stack).

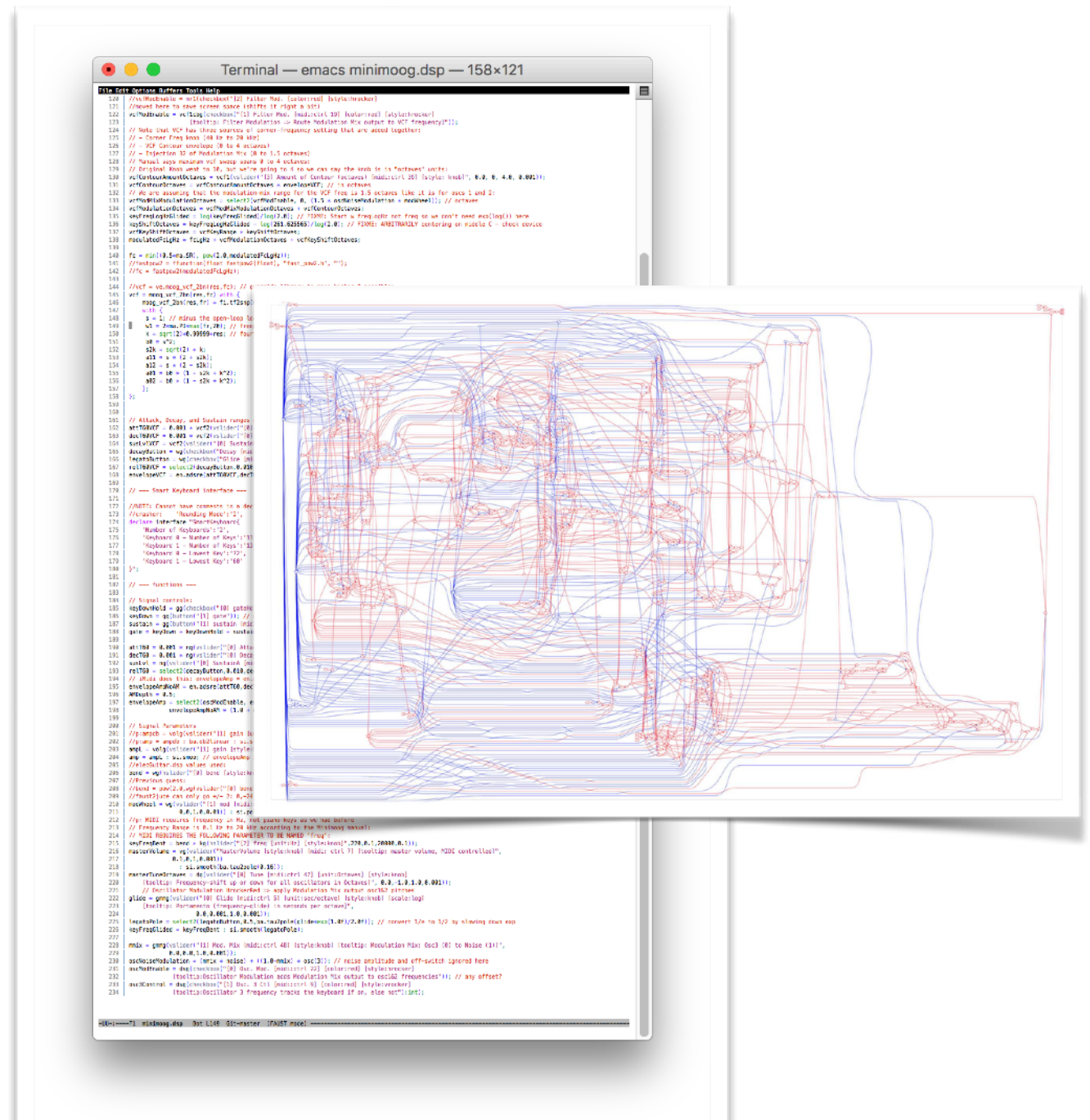


SHARC Audio Module Workflow Using Faust



Virtual Analog Model + Effects Chain written in Faust, migrated to the SHARC Audio Module + AudioProject Fin

- Virtual Analog runs on Core 1 using ~8% CPU
- Effects Chain runs on Core 2 - Echo, Reverb, Chorus, flanger
- MIDI is the API! All 72 controls mapped to MIDI.
- Prototyped on using **faust2caqt** or a web browser.
- Migrated to the SHARC Audio Module/CCES using **faust2sam**



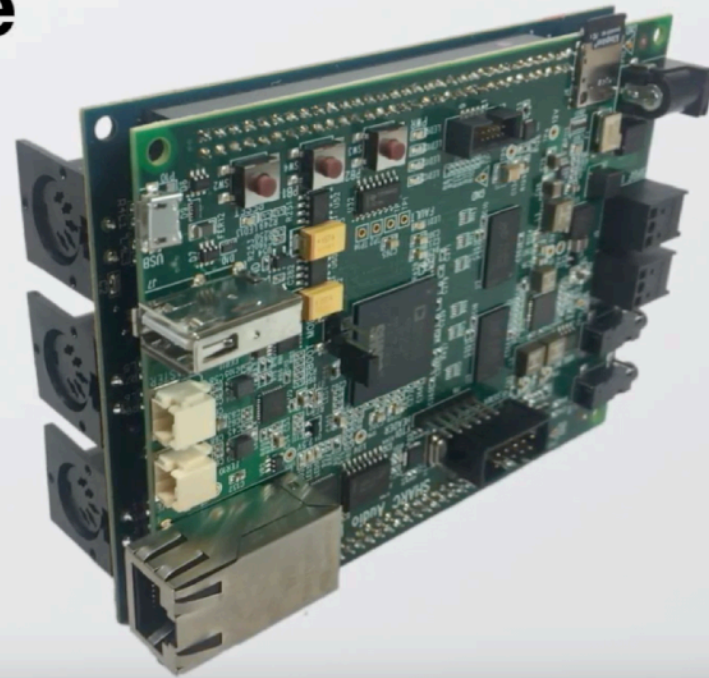
Demos



Demos: Faust Code on the
SHARC Audio Module

Step-by-Step Video

Compiling and Running Faust Algorithms on the SHARC Audio Module



0:02 / 24:01



Links

Faust

Faust - <http://faust.grame.fr>

Faust online editor - <https://faustcloud.grame.fr/tools/editor/index.html>

Faust Documentation - <https://faustcloud.grame.fr/doc/manual/index.html>

Faust Libraries - <https://faustcloud.grame.fr/doc/libraries/index.html>

Faust Tutorials - <https://faustcloud.grame.fr/doc/tutorials/index.html>

Faust Examples - <https://faustcloud.grame.fr/doc/examples/index.html>

Dr. Julius O. Smith III's site about Faust - <https://ccrma.stanford.edu/~jos/spf/>

Romain Michon's Faust tutorials - <https://ccrma.stanford.edu/~rmichon/faustTutorials/>

Romain's online Faust course - <https://ccrma.stanford.edu/~rmichon/faustWorkshops/course2015/>

FAUST (programming_language) Wikipedia - [https://en.wikipedia.org/wiki/FAUST_\(programming_language\)](https://en.wikipedia.org/wiki/FAUST_(programming_language))

Analog Devices

CCES - <https://www.analog.com/en/design-center/processors-and-dsp/evaluation-and-development-software/adswt-cces.html>

Faust Integration with the SHARC Audio Module - <https://wiki.analog.com/resources/tools-software/sharc-audio-module/faust>