First Sighting of GeoShred on Linux

CCRMA Open House 2022

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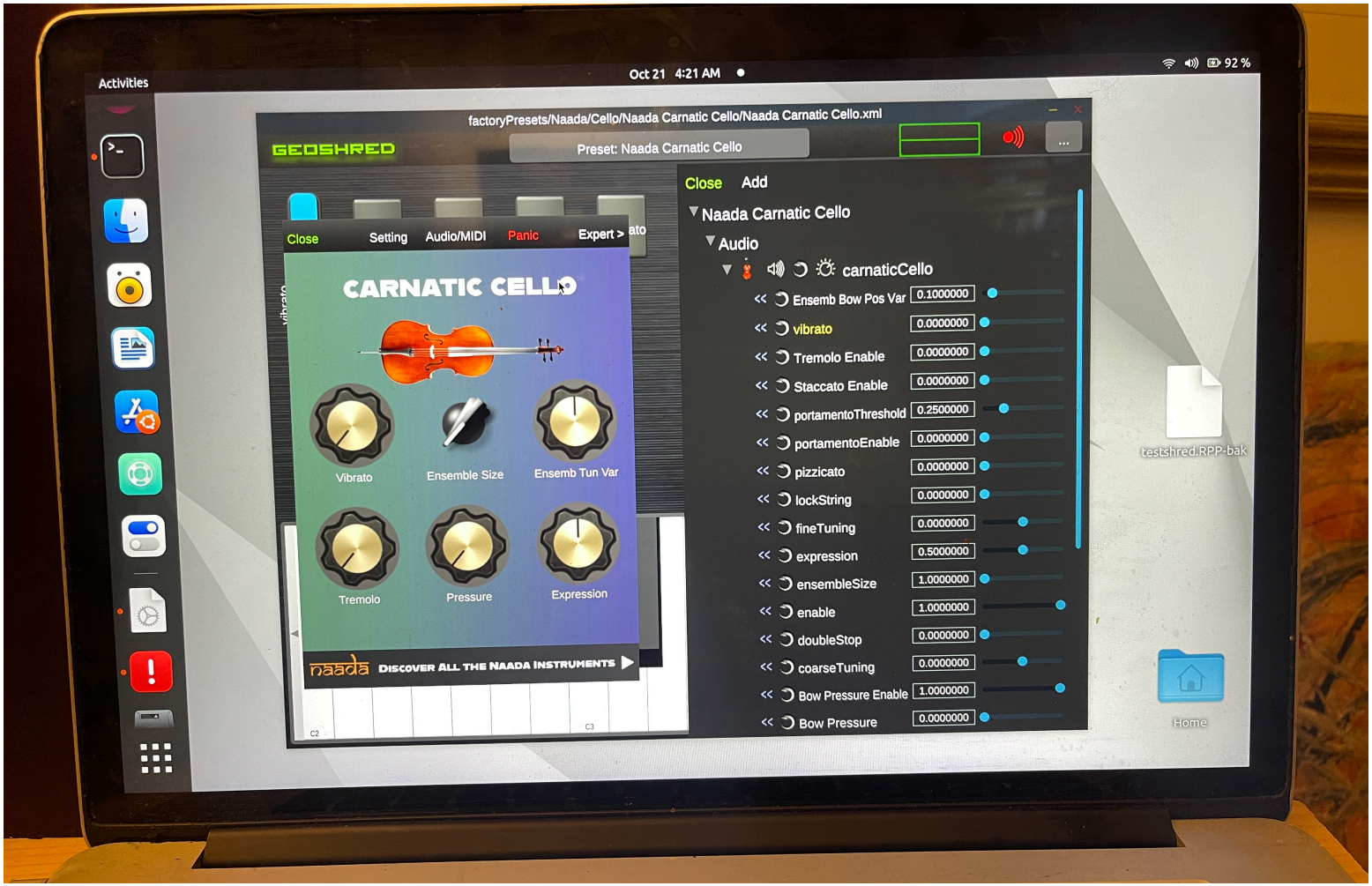
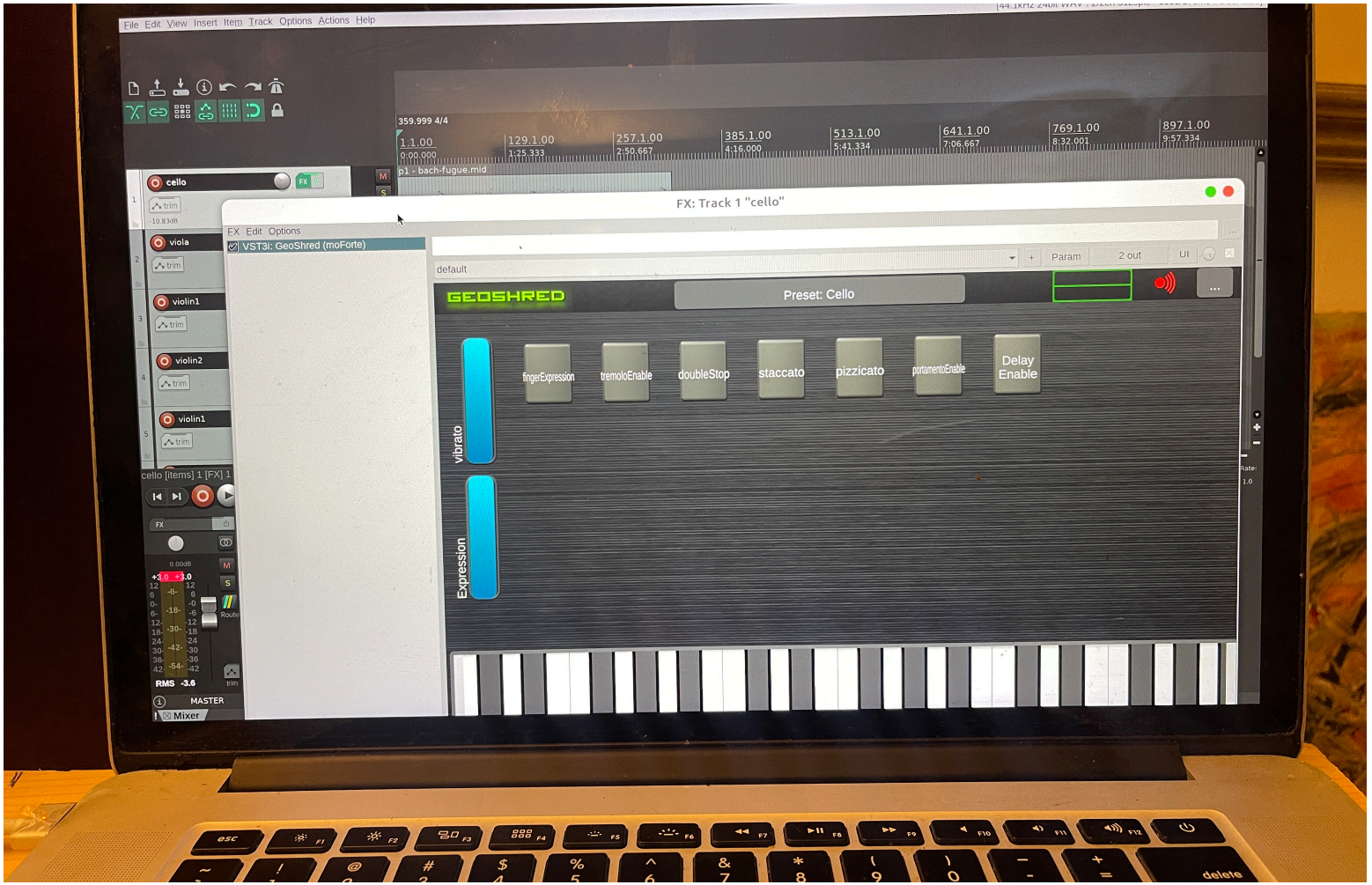


GeoShred/Linux Standalone



GeoShred/Linux running under Reaper

10/21/2022

GeoShred/JUCE

- Chris Chafe kept bugging me about it for years so I finally did something about it!
- Portable: Linux/Windows/macOS via JUCE.
- Leverages Plugin GUI Magic for preset editing and UI editing.
- ValueTrees used extensively, thanks David Rowland.
  - Communicate across different objects.
  - Undo/Redo
  - Simplifies code.
- Each preset can have a totally flexible UI.
- Works as a VST3 plugin. Soon AUv3 and others as required.

Demo: 3D Guitar

- Latest from Julius

Demo: Naada Instruments

- Suthu from Bangalore India. Engineer, musician, GeoShred user.
- Studied Julius' work and gave us a blow-away demo.
- Indian bowed strings, woodwinds and Veenas.
- Coming in the next GeoShred release.

Naada Instuments in the next GeoShred release

Demo: GeoShred standalone

Plugin GUI Magic

- Flex/Box grid based on CSS standards
- Works like a responsive website.
- Not perfect, but special cases can be encapsulated.
- Better to use code as opposed to a custom XML file format because special case handling creates redundant or complex XML
- Grid was sufficient because the UI only needs to scale.
- Adpated for new preset editor and live layout editor.

Preset Format

- Attributed XML preset format - easy to edit
  - Each preset lives in it’s own folder
  - Easy to edit and add new presets.

Editors/Performance

- Preset Editor
  - Add new processors
  - See all parameters at once, drag to control surface.
  - MIDI learn/assign
- Control Surface Editor
  - Based on PluginGUIMagic - easy to make the preset look like anything
  - Video possible
- Keyboard
  - Rewrite of GeoShred keyboard in near future
  - Conventional MIDI keyboard from JUCE.
- GeoShred Control
  - Best controller for GeoShred is, uh, GeoShred!
  - Easy to connect from Mac.
  - Anybody want to try doing it from Linux?

Audio and MIDI processors

- Main audio callback iterates over processors. It's all C++ little overhead.
- Greatly simplifies adding new processors - for audio and MIDI.
- Thanks Jatin for the idea!

```
// Then run the result through the fx chain
for (MFAudioProcessorWrapper *processor : instruments) {
    for (int channel=0; channel<MIN(numOutputChannels,numInsChannels); channel++) {
        int startSample = 0;
        mixerBufferP->addFrom (channel,
                               startSample,
                               *instrumentBuffer,
                               channel,
                               startSample,
                               numSamples);
    }
}

// Run result through the fx chain
// the amp is the last thing in the chain (enforced by GeoShred)
for (MFAudioProcessorWrapper *processor : effects) {
    processor->setNumOutputsLastProcessor(numChannelsRunning); // processing in-place => must
      provide this
    juce::AudioBuffer<float>* possiblyUpsampledBufferP = resampler->maybeResample(processor);
    processor->processBlock(*possiblyUpsampledBufferP,midiMessages);
}
```

Main Processing Loop

Development Environment: macOS/Linux/Windows on late 2013 MacBookPro

- Many thanks to Leigh Smith for showing this!
- Make boot drive from Ubuntu site.
- Get refind boot manager
- Partition disks - ext4 for Linux, FAT for Windows
- Install packages for development environment
- Tweak CMake for Linux/Windows
- Might need to debug on Linux/Windows
  - Some differences in compiler behavior, wrt warnings and perhaps worse.

Demo: Bach Fugue

- 1988 NeXT Computer Introduction demo
- Reaper project -
  - Converted BachFugue.score to MIDI with a new program.
  - Intended for different instrument (plucked string) so more hand editing will be required.
- Naada Instruments running under GeoShred replace the plucked string
- Ambisonic rendering on the CCRMA Stage

Build System

- CMake build system
  - Easy to target multiple platforms
  - Thanks Eyal Amir for some great examples.

When will it be available?

- Not sure, we still need to figure out a distribution scheme. Stay tuned!
- In the meantime download GeoShred iOS!
  - Contact me for more information:
  - nick@ccrma.stanford.edu or nick@moforte.com