Become a rockstar using FOSS!
(Or at least use FOSS to write and share music for fun!)

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Clickbait title alert: **not** a rockstar!

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I know one of them was me, so who was the other one?! #spotify #november

LORENZO MINIERO HAD

2 listeners
But that doesn’t mean you can just have fun 😊
Lorenzo Miniero

- WebRTC developer (Janus)
- Hobbyist musician
- Love metal & orchestral!

Let’s keep in touch!

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A barebones TOC

• We’ll talk about (not necessarily in this order...)
  • The FOSS music ecosystem
  • How you can write some music (composition and orchestration)
  • Different ways of rendering virtual instruments
  • Recording and/or processing real instruments
  • Putting it all together in a DAW (mixing and mastering)
  • How you can distribute the result (on demand vs. live)

• Please notice we will only scratch the surface, though
  • There’s so much to talk about and so little time!
  • Besides, I’m no expert: there’s good chances I’ll say something wrong... 😊
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FOSS music ecosystem is amazing!

- Audio backends getting easier to use at low latencies
  - e.g., ALSA, JACK, Pipewire, etc.
- Port-based approach helps avoiding monolithic applications
  - Different applications to deal with different requirements
  - They can then all connect to each other
- Many existing alternatives for different requirements
  - Easy to find what works best for your needs
  - Different genres may require a different approach
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An important distinction before we start

- Applications will work with audio and/or MIDI signals
  - Results may be similar, but they’re not the same “thing”!

- Audio signals
  - Basically a waveform, an actual sound being captured/reproduced
  - What may come from a microphone, or what’s sent to your speakers

- MIDI signals
  - Information about specific notes being played (e.g., on a keyboard)
  - Will often be translated to an audio signal itself (e.g., with virtual instruments)

- Some applications will only work with one, others with both
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JACK Audio Connection Kit (JACK)

https://jackaudio.org/
One Pipewire to rule them all!

https://pipewire.org/
Capturing an instrument to make some noise

- You have your guitar/bass and your laptop, what do you do now?
  - You can’t just plug the jack in the mic slot!

- You’ll need an audio interface of some sort
  - e.g., USB audio interface with XLR/3.5mm inputs
  - Interface ports then available as a system “capture”

- What to capture depends on what you need
  - e.g., straight from the cable vs. already processed for electric guitar
  - Acoustic guitars sometimes recorded from multiple sources at the same time
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The one I personally use (note: cat not included)
Audio interface + instrument + JACK

![Diagram of audio interface with XLR and 3.5mm connections, leading to a system with capture_1 and capture_2]
Audio interface + instrument + JACK
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Audio interface + instrument + JACK
Guitar/bass processing: Guitarix

https://guitarix.org/
Guitar/bass processing: Guitarix
Guitar/bass processing: Rakarrack

https://rakarrack.sourceforge.net/
Guitar/bass processing: Rakarrack
Why not both at the same time? 😊
What if we want to record it, now?

- Any recording application that can act as a JACK sink will do
  - e.g., Audacity, GStreamer, etc.

- Good chances are you want to work within a “project”, though
  - Multiple tracks for different instruments
  - Ability to add filters to work on tracks dynamically

- That’s where a DAW can help!
  - Digital Audio Workstation
  - Conceived to record, edit and produce audio files of different kinds
  - Modular nature adds support for filters, EQ, compression, etc.
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The one I personally use: Ardour

https://ardour.org/
That’s a lot of connections!
Adding drums (without a drummer!)

• Let’s assume we have bass and guitars, now: what about drums?
  • Unless you have a “real” one, that is!

• First good example of “virtual instrument”
  • We’ll need to “write” the drum parts
  • Something will then need to “sequence” them (drum sounds)

• While you can write MIDI manually, patterns are easier to work with
  • Rhythmic parts can be repeated, with some variations
  • Percussive nature of instrument helps too
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An excellent pattern based drum machine: Hydrogen

http://hydrogen-music.org/
Drumkits

This is a list of DrumGizmo drumkits. Over time we plan on releasing more kits, some in collaboration with the community.

CrocellKit

DRSKit

https://drumgizmo.org/
What about other virtual instruments?

- We added guitars, bass, even drums, but we may want more
  - Maybe a keyboard background...
  - ... or a piano/synth solo ...
  - ... or even a full orchestra!

- Just as with drums, this is where MIDI helps
  - We’ll have information on which notes to play, and how
  - Something will then turn that to “sounds” (e.g., a trumpet)

- Notes can come from different places
  - Hardware keyboards often have USB MIDI support (a source in JACK)
  - Or we might simply want to write the parts ourselves instead
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You don’t need that many keys to have fun!
Using soundfonts (SF2): Fluidsynth/Qsynth

https://qsynth.sourceforge.io/
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Using a more complex synth: Yoshimi

https://yoshimi.sourceforge.io/
Using a more complex synth: Yoshimi
Using Sforzando format (SFZ): sfizz

https://sfz.tools/sfizz/
Using Sforzando format (SFZ): sfizz
Using Windows VSTs: LinVST (e.g., via Carla)

https://github.com/osxmid/LinVst
Using Windows VSTs: LinVST (e.g., via Carla)
Writing music as if you were programming: Lilypond

https://lilypond.org/
A simpler WYSIWYG approach: MuseScore

https://musescore.org/
Don’t know music notation? Piano rolls to the rescue!
Your song’s ready: what now?

- Many places where you could upload it to
  - e.g., Soundcloud, Jamendo, Youtube/Peertube, etc.
  - Bandcamp good option to try and monetize your music
  - Spotify, Apple Music, etc. need intermediary (e.g., Distrokid)
    - ... but they’re only worth it if you want to “be there”
    - Royalties per play are beyond ridiculous

- Make sure you engage the community for feedback and learning!
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  • https://linuxmusicians.com/viewforum.php?f=9
  • https://discourse.ardour.org/c/community/made-with-ardour/13
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“All I want for Christmas is Odin”

https://www.youtube.com/watch?v=hxjwb8mzDQQ
https://peertube.tv/w/jGRAueDQFvhhNC2y1CYdKE
“Can WebRTC help musicians?”

Can WebRTC help musicians?
Going beyond traditional and boring use cases to support the arts
Lorenzo Miniero
D rtc
2021-02-06

https://fosdem.org/2021/schedule/event/webrtc_musicians/
Thanks! Questions? Comments?

Contacts

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- 🐦 https://fosstodon.org/@lminiero
- 🦅 https://twitter.com/elminiero