

# Do you even emulate... (Super Mario) bro?



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# About the speaker

- Electronics, DIY
- Swimming
- Software developer in telecomms

# Talk details

- Why writing an emulator is awesome
- Brain dump → objective arguments
- Why the “why”?
- Target audience:
  - Solid foundation in programming, CS fundamentals
  - Curious about a computer’s inner workings
  - Interest in retrocomputing/gaming console history

# The journey, vol.1: Why this talk?

- Interest in console emulators → oddly specific
- 1<sup>st</sup> Emudev track @FOSDEM!
- But why are emulators so cool?
- Find an answer! (and inner peace?)
- Resonates with others? → this talk!

[1]

# The journey, vol.2:

## Down to basics

### Facts:

- I like computers (I'm sure you weren't expecting this...)
  - Video games (NES, PlayStation, N64)
  - Early 2000s → first PC → emulators
- Curious about how things work on the inside
- “How did this come to be?” (i.e. the story behind it)
  - Sony/Nintendo gaming console partnership <sup>[2]</sup>

# The journey, vol.3: year of the ~~dragon~~ CHIP-8

- Early 2000s ~~load savestate...~~ flashback
  - Emudev people == Gandalfs
  - But how to... emulate them? (heheh)
  - Do you even program, bro?
- Mid-2010s light bulb moment: “How about now?”
- Chip-8 interpreter → tons of fun

# The verdict, vol.1: you have fun

- Emulator development  $\approx$  beating a video game
  - Core functionality  $\approx$  main story
    - Well-specified hardware & software  $\approx$  “begin” / ”end”
    - System specification  $\approx$  the rules of the game
  - Extra features  $\approx$  side missions
    - Fast-forward
    - Savestates
    - Go back in time!
    - Improved graphics, etc.

[4]

# The verdict, vol.1: you have fun

- Computing done backwards
- Build a computer, no hardware required
- Once done, the software just works™ \*
- Relatable context (video games)

\* a.k.a. “When I run my code for the first time” [3]



# The verdict, vol.1: you have fun

- End result: self-explanatory, relatable (not just for you!)
- Show it off, expect people to actually... “get it” :)
- Bonus: you don’t have to write the game!

# The verdict, vol.2: you learn

- Technical
  - Registers, memory, interrupts, assembly, etc.
  - Not university coursework!
- History
  - Crash Bandicoot (PlayStation hacks) <sup>[5]</sup>
  - Resident Evil 2 (fitted onto 64 megabytes!) <sup>[6]</sup>

# The verdict, vol.3: you appreciate

- Best practices
  - Efficient code
  - Maintainable code
  - *Use the debugger* (you will write one, too!)
- The luxuries we have today
  - Tools, libraries, SDKs, high-level languages
  - Day-1 patches
    - Gran Turismo 2 NTSC-J (could not get past 98.2%!) <sup>[7]</sup>

# The verdict, vol.3: you appreciate

- FOSS/emudev/homebrew communities
  - Academia
    - Technical & historical context
  - Computer history preservation
    - Through documentation/emulation
    - People still write Game Boy games!

# An awesome journey

- Fun, educational
- Humbling, inspiring
- A better engineer

# Y u no emudev??

- It doesn't have to be C/C++/Rust \*  
\* but set your expectations accordingly!
- Online communities
  - Reddit, Discord, FOSS projects, blogs, etc. [9]
  - Guidance, tons of resources
- That's all, have fun!

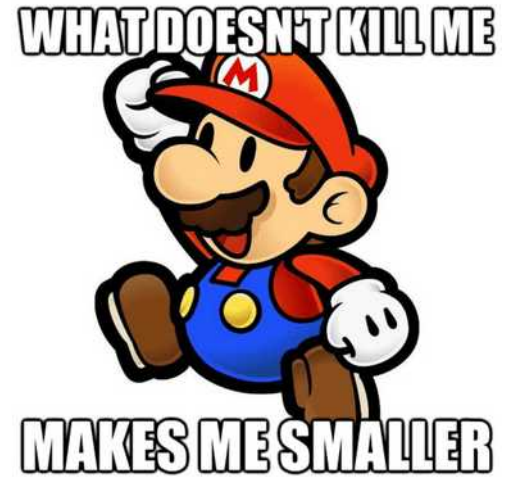
# See you at FOSDEM 2022!

Feedback (much appreciated, thanks!)

<https://submission.fosdem.org/feedback/11536>

## References

- [1] GIF from "The Room" (by Wiseau-Films)
- [2] Nintendo "Play Station": <https://www.polygon.com/2015/7/3/8889237/nintendo-play-station>
- [3] <https://thecodinglove.com/when-i-launch-my-script-for-the-first-time>
- [4] Fast-forward showcase using mGBA: <https://github.com/mgba-emu/mgba>
- [5] Crash Bandicoot war stories: <https://arstechnica.com/gaming/2020/02/war-stories-how-crash-bandicoot-hacked-the-original-playstation/>
- [6] Resident Evil 2 on N64: <https://www.youtube.com/watch?v=BaX5YUZ5FLk>
- [7] Gran Turismo 2 bug: <https://www.ign.com/articles/2000/01/21/sony-answers-gt2-questions>
- [8] µCity (Game Boy homebrew): <https://github.com/AntonioND/ucity>
- [9] Emudev communities  
<https://www.reddit.com/r/EmuDev/>  
<https://discord.me/emudev>



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