



Pure Data + Game Audio

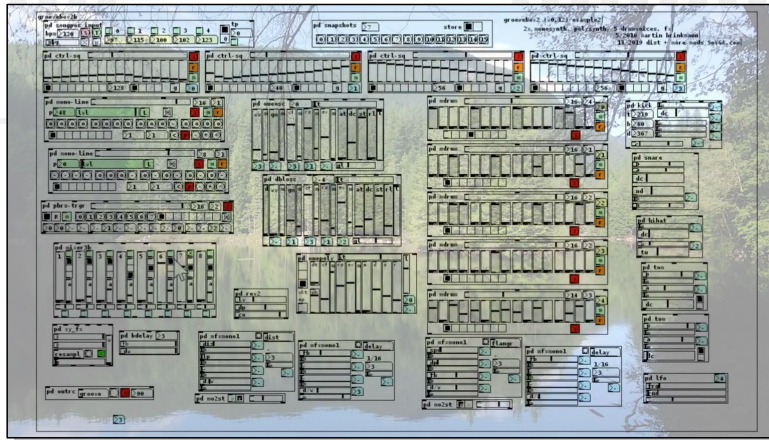
**Leonard Paul
School of Video Game Audio**

**<http://School.VideoGameAudio.com>
[@SchoolGameAudio](#)**

What's Pure Data?

#Noisevember posts from 2017-2019

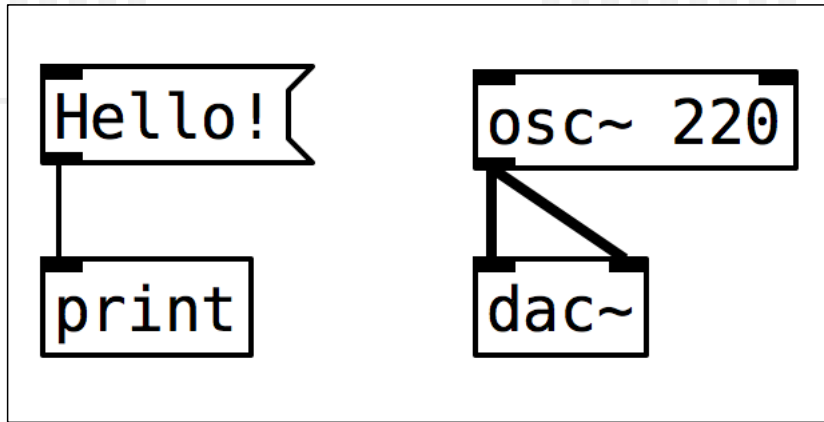
Link: [Twitter.com/#Noisevember](https://twitter.com/#Noisevember)



Pure Data “Vanilla”

Pure Data is an open source visual scripting language

Download: <http://msp.ucsd.edu/software.html>



Purr Data's a prettier version of Pd with more objects

Download: <https://agraef.github.io/purr-data/>

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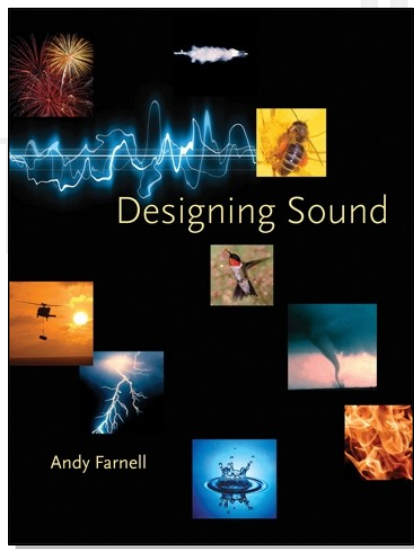
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Beep: A History of Game Sound Documentary

Designing Sound – Andy Farnell

Procedural audio book using Pure Data

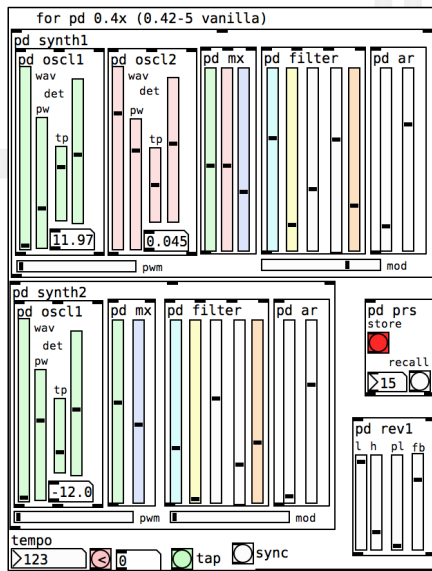
<https://mitpress.mit.edu/books/designing-sound>



Pure Data Patch Library

Martin Brinkmann

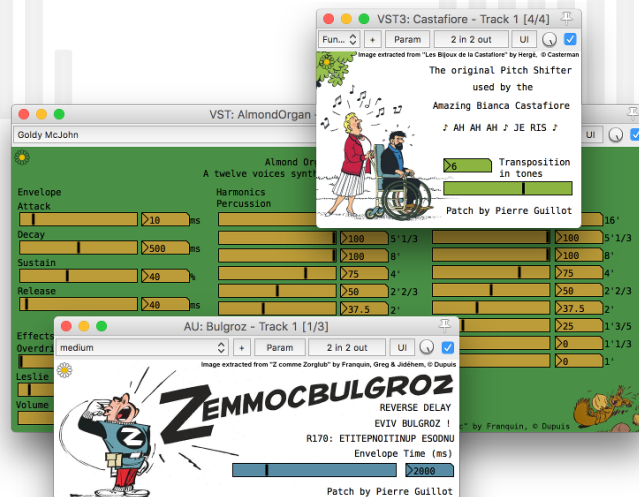
<http://martin-brinkmann.de/pd-patches.html>



Camomile

Make VST synth + effect + MIDI plugins

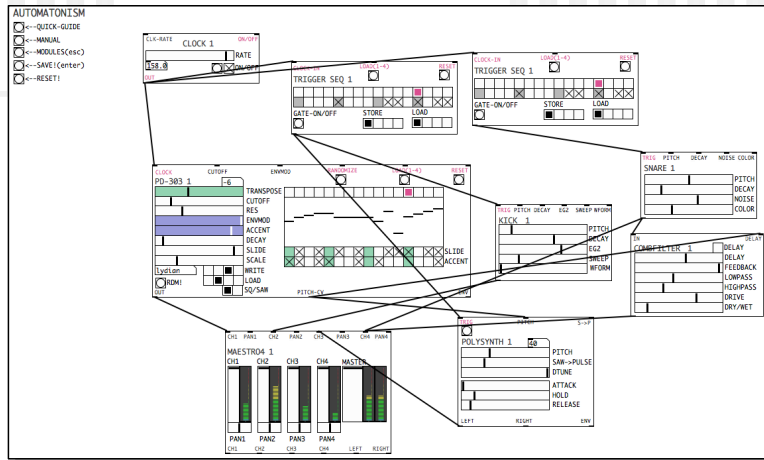
Link: github.com/pierreguillot/Camomile



Automatism

Easy modular synth style patching

Link: automatonism.com/the-software



Pure Data Forum & Patches

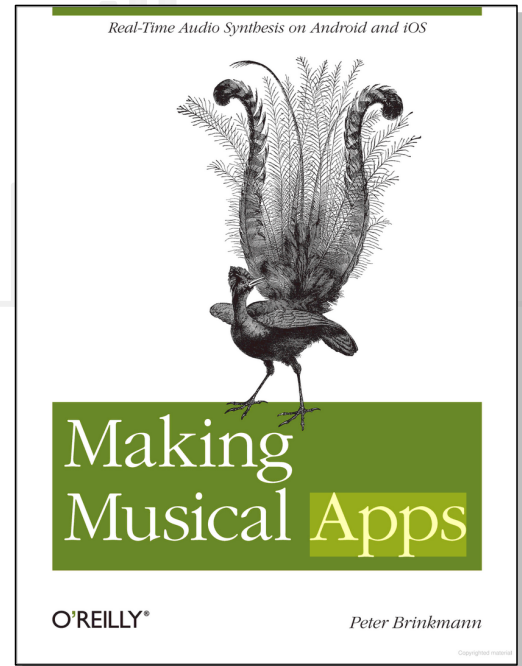
Patch repository & forum

forum.pdpatchrepo.info



LibPd Pure Data

- A library that interprets Pd patches
- Disadvantages: Slow, Pd patch is public
- Advantages: Same as Pd, flexible
- Can be fast enough for making apps: Book

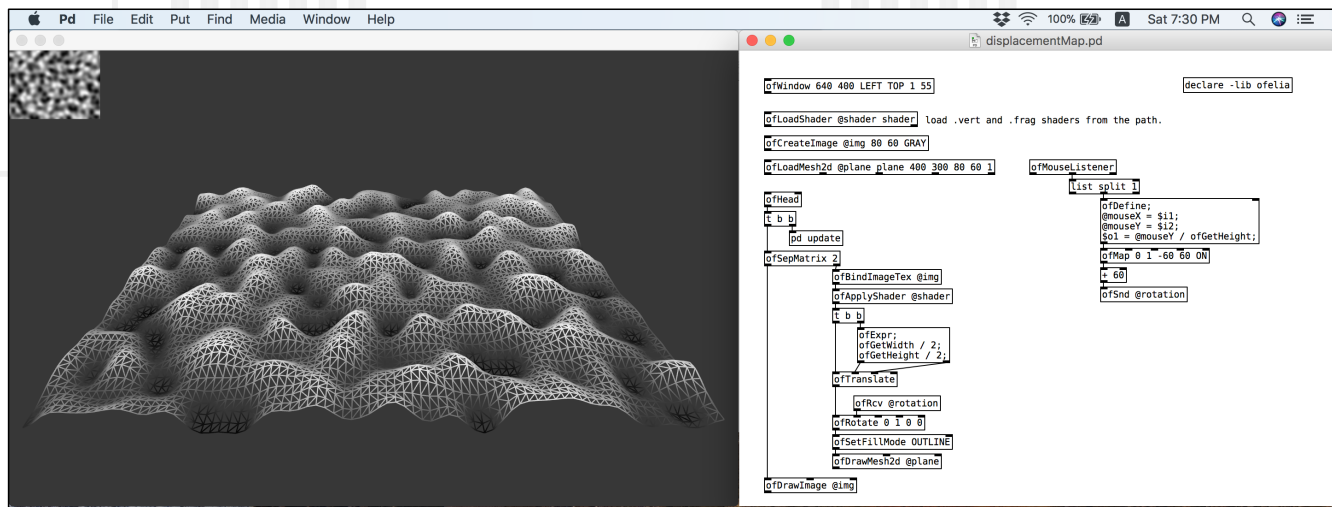


Ofelia for Pure Data



Open Source – GitHub – Open Frameworks

<https://github.com/cuinjune/ofxOfelia>



Ofelia for Pure Data



- Compiles OpenFrameworks code
- Interprets Pure Data audio using LibPd (slow)
- But, can be good enough for apps: Esmeril



Heavy Compiler for Pure Data



Enzien Audio – Open-source

<https://github.com/enziinaudio>

Can download (Windows, Mac & Linux) or use online at RebelTech

<https://www.rebeltech.org/2018/09/12/compile-pure-data-patches-with-free-online-heavy-compiler/>

Unmaintained on GitHub but robust enough for production

The screenshot shows a web form titled "Login / Register". It contains two input fields: "USERNAME OR EMAIL ADDRESS" and "PASSWORD". Below the password field is a red "LOGIN" button. At the bottom left, there is a checkbox labeled "Remember me". At the bottom right, there is a link labeled "LOST YOUR PASSWORD?".



HTML5 = Pd + Heavy

Chris Heinrichs - <https://twitter.com/krighxz>

[adultswim.com/etcetera/choir/](https://www.adultswim.com/etcetera/choir/)

<https://www.adultswim.com/etcetera/elastic-man/>





Heavy Platforms

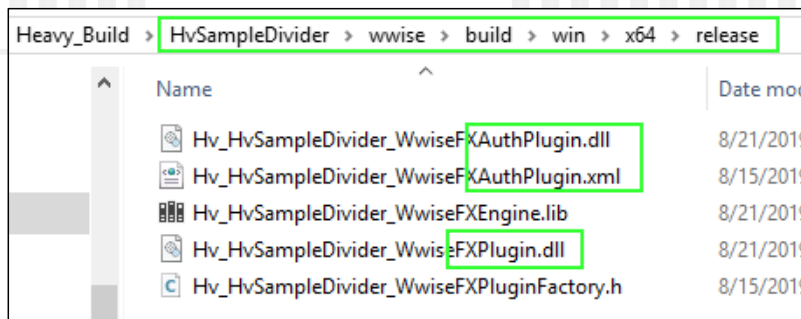
- Heavy compiles for:
 - C – Use nearly anywhere
 - Bela - Arm Cortex-A15
 - Fabric – Unity audio middleware
 - JavaScript – HTML5
 - PdExt – Make a Pd object
 - Unity – Plugin or effect
 - Vst2 – Great for use with DAWs
 - Wwise – Effect or Synth

Heavy Compiler with Wwise



Audiokinetic Article Series

How Sound Designers Use PureData + Heavy to Develop DSP Plug-ins - Part 1

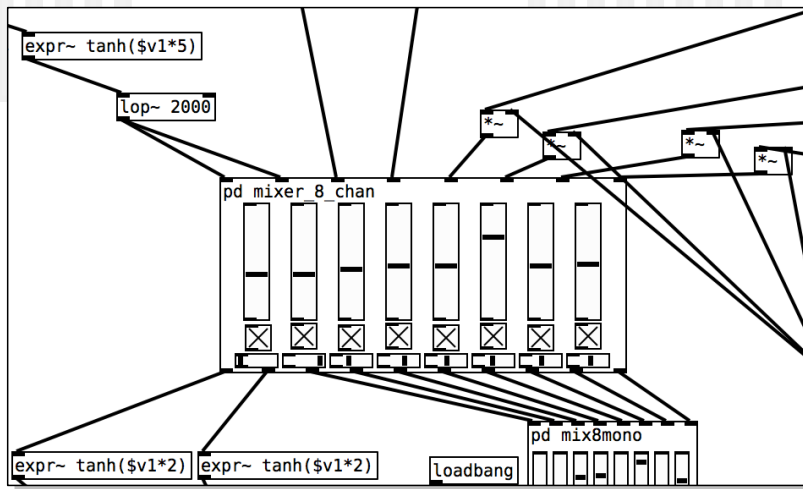




Student Example

Thareeq Roshan - 100% Samples

[Twitter.com/SchoolGameAudio/status/1180511781040480258](https://twitter.com/SchoolGameAudio/status/1180511781040480258)





Student Example

Ricardo Pujol – Unity Lightsaber Pd example

Link: [YouTube](#)





Student Example

S. Elliot Perez - 100% Synthesis

https://www.youtube.com/watch?v=Pdzz2Y4WNio&list=PL17-p74MQ_0T1SfrMWhjHVYCishxUEz_U&index=2&t=0s



Pd+OSC for Unity



Complete-Game.unity - Tanks - PC, Mac & Linux Standalone (Personal) <OpenGL 4.1>

OSC_Receive

OSC_Send

Music

TankMove

Tank_SFX

Tank_Hit

Shell_Hit

SoVGA.com

```
// ... change the clip to driving and play.
m_MovementAudio.clip = m_EngineDriving;
m_MovementAudio.pitch = Random.Range(m_Origina
m_MovementAudio.Play();
}

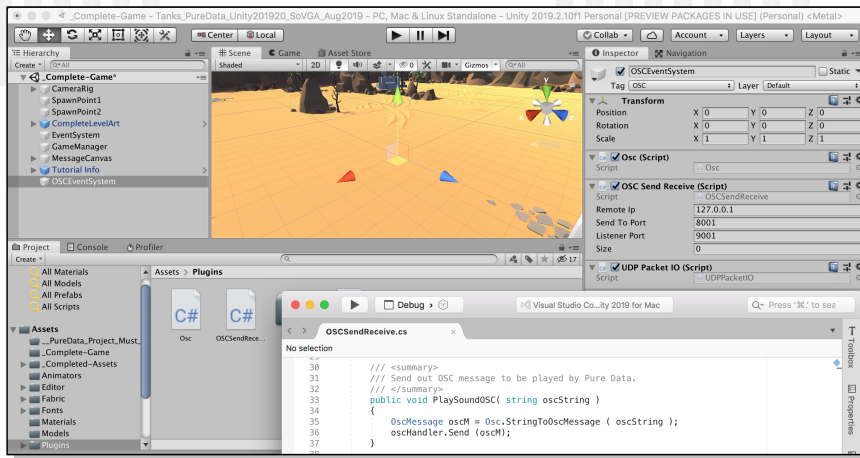
// SoVGA: Use Heavy or Pure Data engine?
if (m_Use_Heavy) {
    // set the speed of the tank engine in Heavy
    HeavyScript.Tank_Speed = m_Magnitude;
} else {
    // find our OSC Library script
    GameObject go = GameObject.FindWithTag ("OSC");
    // send a /Tank_Speed OSC message with the playe
    go.GetComponent<OSC_Sender>().PlaySoundOSC
    // read the m_size variable set by Pd engine pos
    transform.localScale = new Vector3 (1, go.GetCom
}

private void FixedUpdate ()
{
```



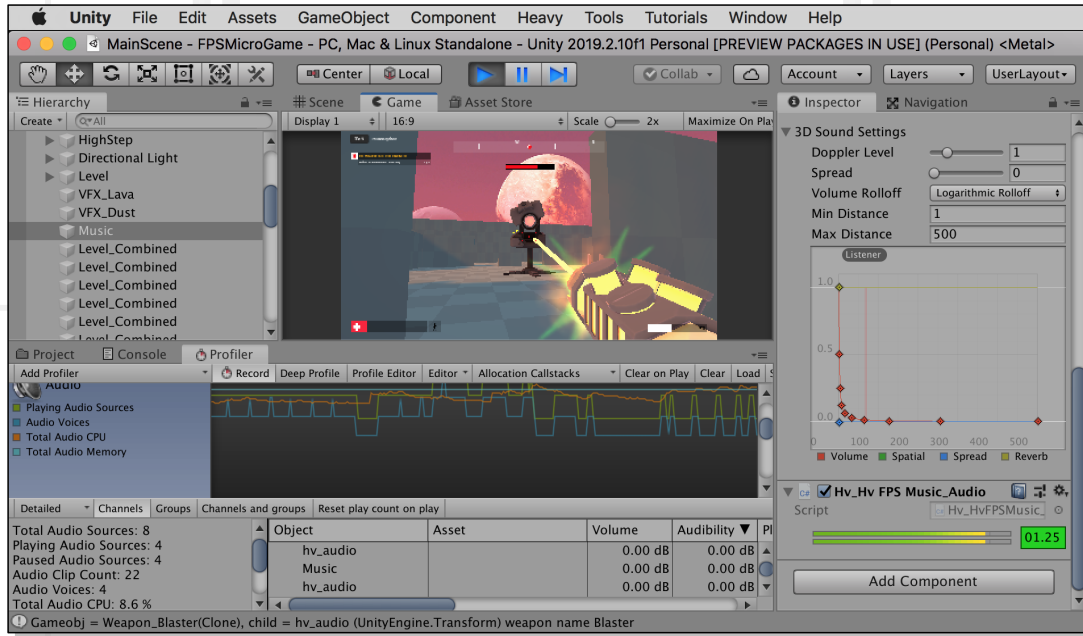
Pd+OSC for Unity

- OSC is great for prototyping as we can run it separately without rebuilding in Unity
- OSC library example in *Tanks* project at [SoVGA.com](https://sovgamedev.com)





100% Heavy Audio Project



Demo adding tempo param?

Curious ?

Feel free to contact me anytime:

Leonard Paul

@SchoolGameAudio

SoVGA.com

