Web Audio Modules

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outline

background

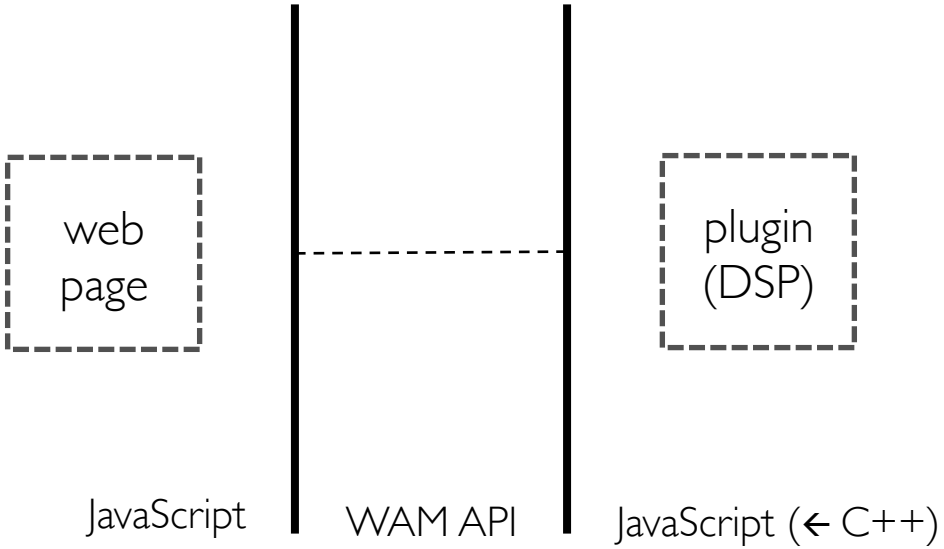
WAM API

demo

implementations

conclusion

browsers	DAWs
web audio modules	plugins
web browser affordances +	music making, performing



native plugin apis

Audio Units

LADSPA

DSSI

DAW Plugins for Web Browsers

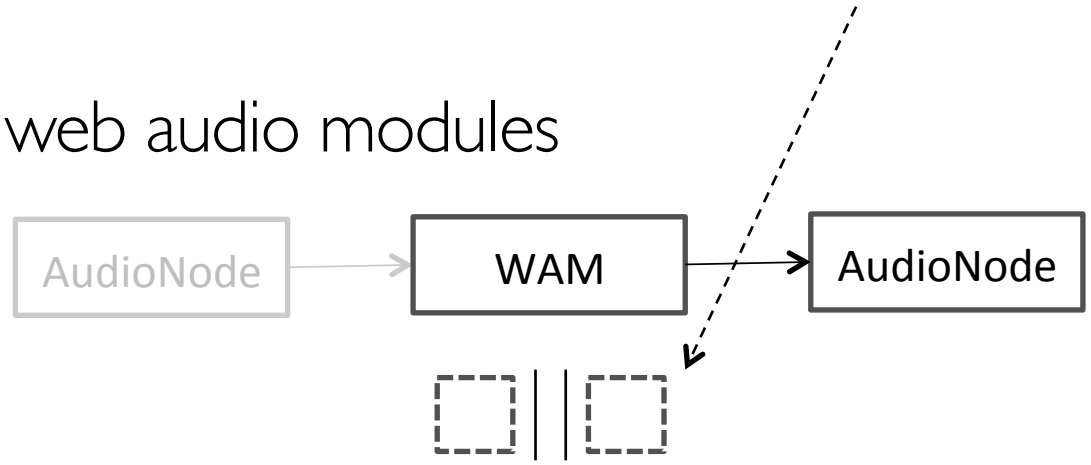
Jari Kleimola / WAC 2015

https://mediatech.aalto.fi/publications/webservices/dawplugins

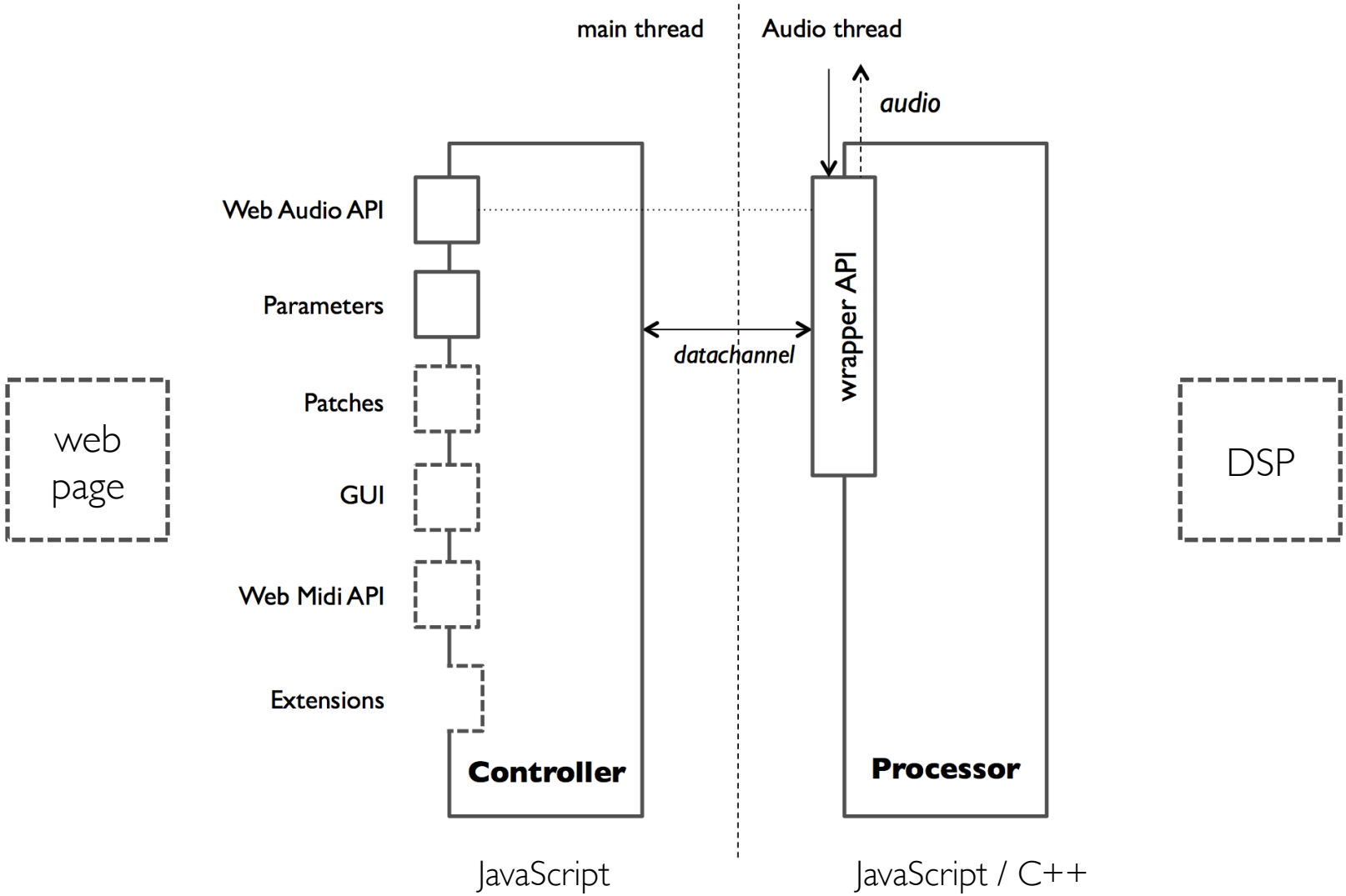
web audio api

cross-compilation

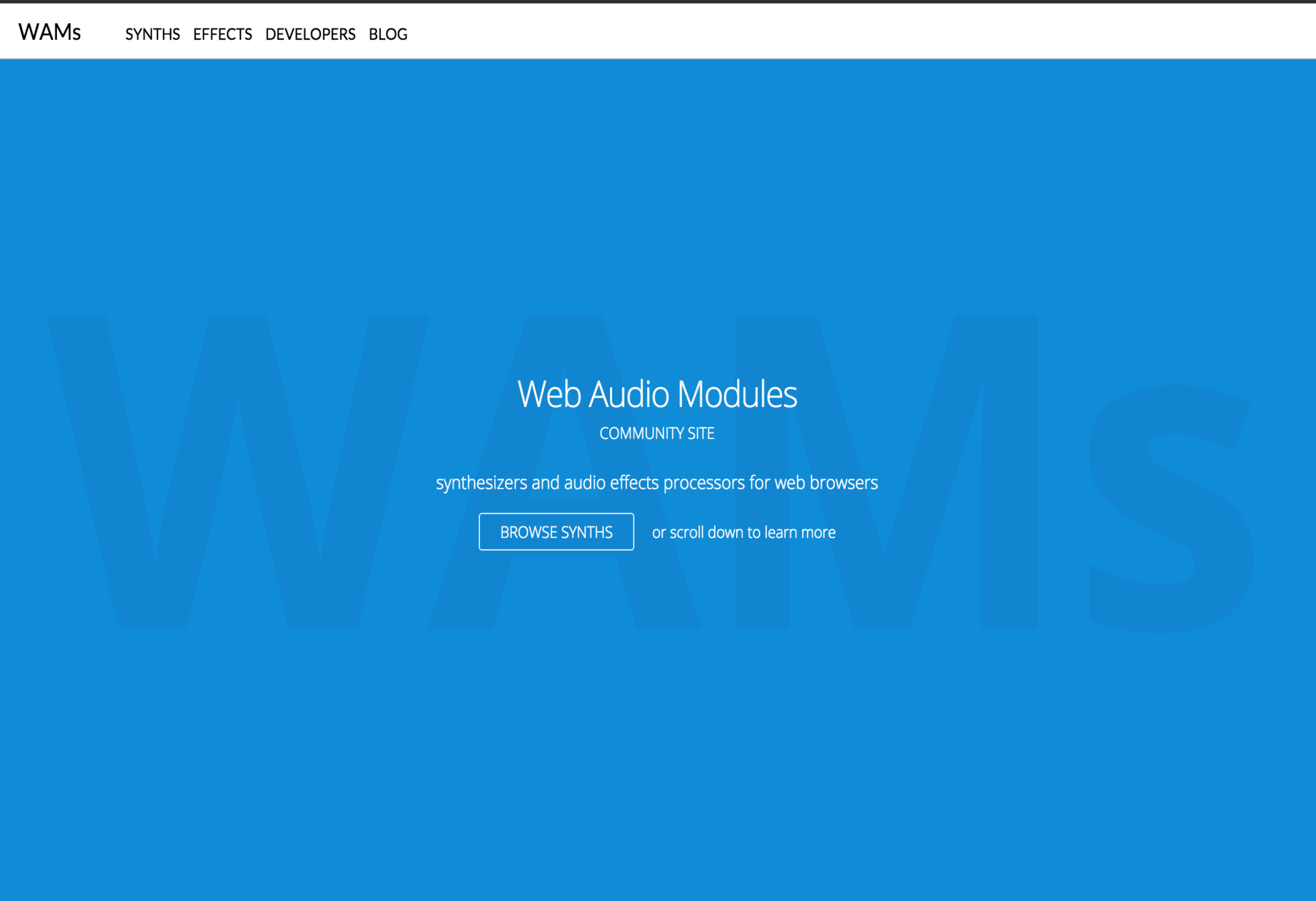
web audio modules



wam api


main thread
Audio thread
audio
Web Audio API
Parameters
Patches
GUI
Web Midi API
Extensions
datachannel
wrapper API
web page
DSP
Controller
Processor
JavaScript
JavaScript / C++

demo


WAMs
SYNTHS
EFFECTS
DEVELOPERS
BLOG
Web Audio Modules
COMMUNITY SITE
synthesizers and audio effects processors for web browsers
BROWSE SYNTHS
or scroll down to learn more

wam usage

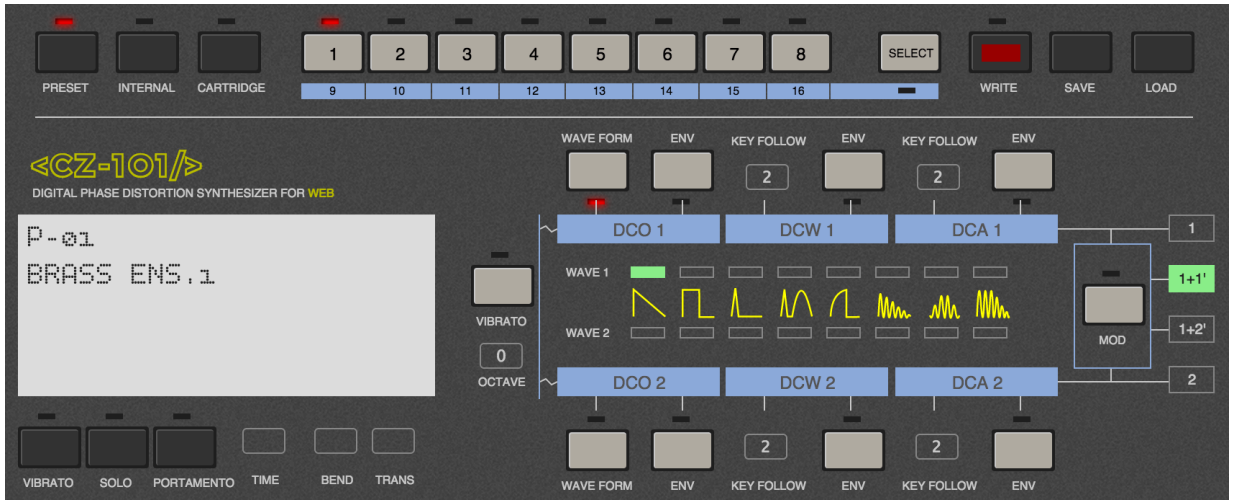
include into a webpage

```
<link rel="import" href="http://webaudiomodules.org/synths/wam-webdx7.html"/>
<wam-webdx7 autoconnect></wam-webdx7>
...
var dx7 = document.querySelector("wam-webdx7").controller;
dx7.postMidi([…]) etc.
```

create one yourself

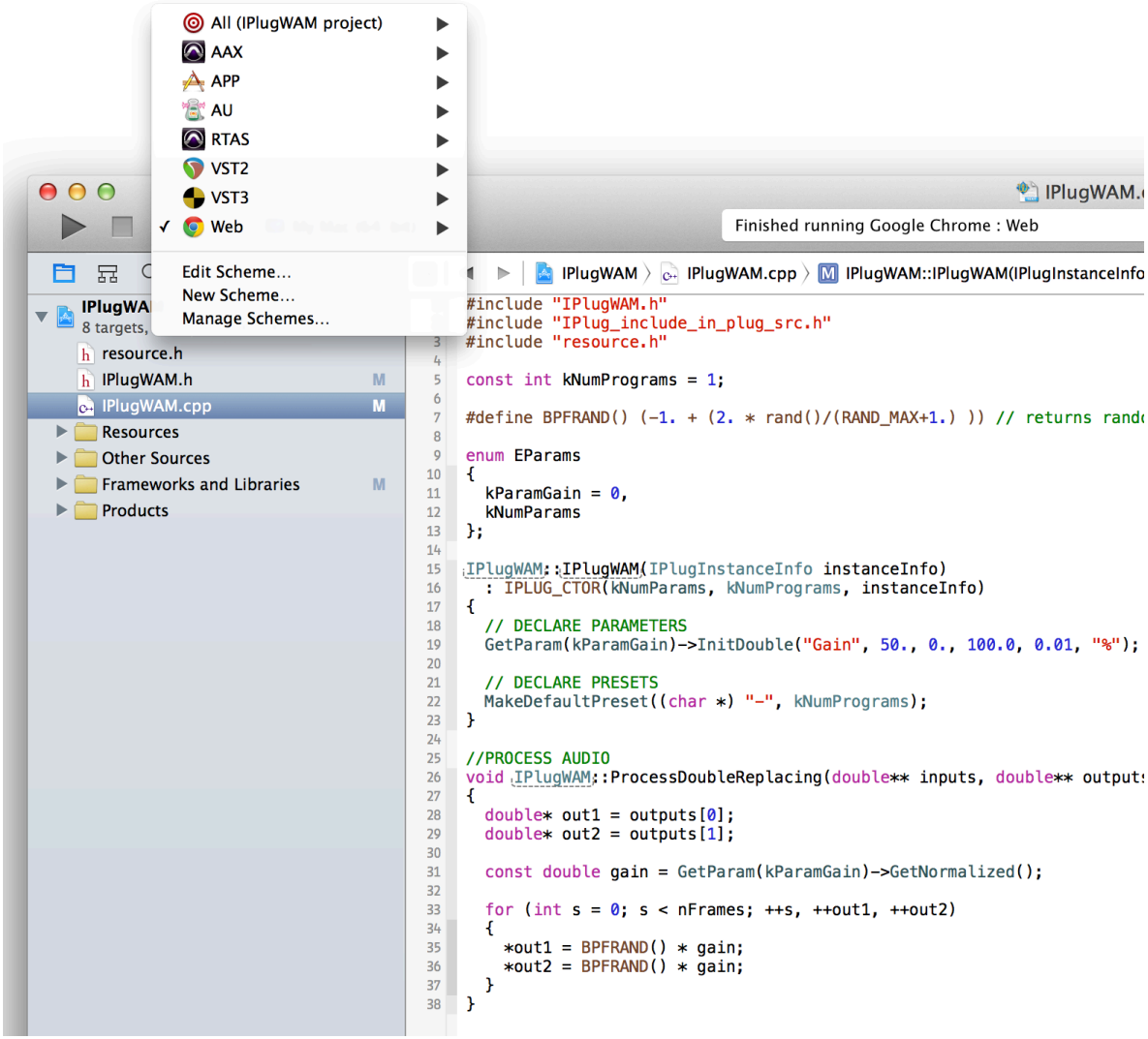
- inherit WAM.Controller
- inherit WAM.Processor / WAM.Synth
- or (re-)use C++ code

webCZ-101/VirtualCZ



IPlug Web Target

- Export IPlug C++ code to ASM.js with template controller JS + HTML glue
- Currently plug-in GUI needs to be re-written

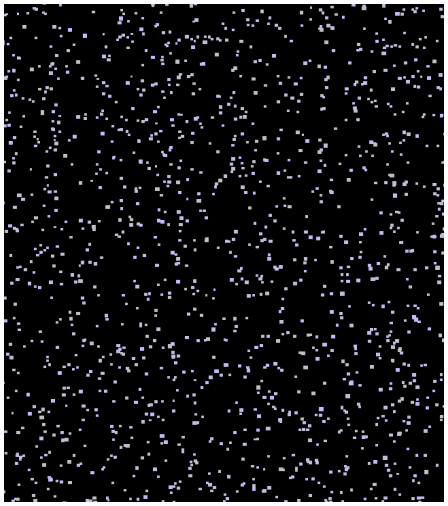


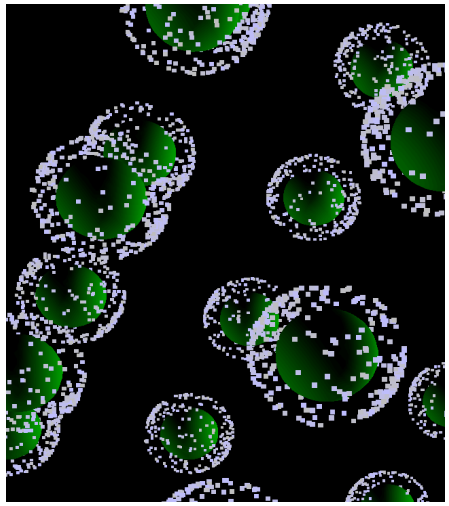
virtual Yamaha DX7 synthesizer

- sound engine by Raph Levien
- ported from vanilla C++, GUI took more time than DSP

patchcloud

- lots of patches in the internet
- interactive webGL visualization





evaluation

Latency

WAM	default	buffer = 32
webCZ-101	48 ms	33 ms
webDX7	45 ms	31 ms

Polyphony

WAM	asm.js	native	
webCZ-101	60	200	30%
webDX7	17	128	13%

commercial issues

- Relatively easy to add support for WAM API to an existing C++ codebase
  - Multithreading, explicit SIMD and platform specific ASM might cause problems
  - GUI needs reworking (but Web UI is the way interfaces are going anyway)
  - Performance slower than native

- emscripten's ASM.js code browseable, and algorithms viewable
- Wams are easily shareable

future work

hosting in soundation

PNaCl + Web Assembly

AudioWorkerNode

GUI codebase reuse

http://chrome.soundation.com

conclusion

proposed streamlined Web Audio Modules API

- virtual instruments and audio effects processors for web browsers
- load with the rest of the page (no manual installation)

two proof of concept implementations

- latencies higher than in native, but gap is narrowing

community website

- hosts WAMs
- documentation
- feedback

THANKS FOR LISTENING !

webaudiomodules.org

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