

Developing NIMEs Using Web Technologies

Presenter: Charlie Roberts || charlie@charlie-roberts.com

Cost: Free.

Goals and Motivation:

Web pages are rapidly becoming the easiest way to experiment with creating NIMEs. Now that the Web Audio API is available on mobile devices, we carry phones and tablets that are able to synthesize realtime audio in the browser while accessing the touchscreen, accelerometer and gyroscope sensors. NIMEs can, in essence, be transported using a simple hypertext link.

Web technologies also offer an extraordinary opportunity for teaching electronic music and audio programming concepts. Instead of requiring students to download an environment and install or compile libraries educators can simply direct students to a website where they can begin experimenting immediately.

This workshop will teach people with a basic programming background to create web-based NIMEs. We will focus primarily on using JavaScript to both define synthesis graphs and create interfaces to control them. By the end of the three-hour workshop all participants will have created a NIME in a web page and will better understand the possibilities and issues associated with musical expression in the browser.

Outline:

- Important things to know about JavaScript that differ from other languages (**45 minutes**)
 - JavaScript Object Notation (JSON)
 - Closures and Functions as first class objects
 - Prototype Inheritance
- JavaScript Audio (**1 hour**)
 - The Web Audio API
 - JavaScript Audio Node
 - Libraries that use the JS Audio Node
 - Audiolib.js
 - Timbre.js
 - Gibberish.js
- JavaScript User Interfaces (**40 minutes**)
 - Touch, Mouse and Motion events
 - Interface.js - a cross-platform library for GUI design
- Node.js (**20 minutes**)
 - An introduction to using JavaScript outside the browser with Node.js
 - Converting data from Web Sockets into MIDI / OSC
- An overview of interesting libraries for NIME research (CodeMirror, Three.js, Share.js...) (**15 minutes**)

Target Audience:

This workshop will target members of the NIME community with basic programming skills (or better) who are interested in creating NIMEs using web technologies. Attendees should understand programming concepts such as objects, methods and properties, functions and control flow. No knowledge of HTML or JavaScript is expected. The first part of the workshop will familiarize participants with JavaScript concepts in a musical context.

Equipment:

For attendees - Ideally attendees will bring a laptop and headphones as there will be time to develop their own NIME, but . Alternatively the class could be held in a computer lab, in which case only headphones are required.

For the presenter - The presenter will need a video projector with a VGA or DVI connection and a stereo 1/8" audio feed with amplification.

About The Presenter:

Charlie Roberts first began teaching JavaScript over a decade ago. Although he has strayed and used many other languages since JavaScript remains his language of choice. His application for creating interfaces on mobile devices using web technologies, *Control*, has been downloaded well over 50,000 times for iOS and Android devices. His recent projects include *Gibber*, a browser-based live coding environment, *Gibberish.js*, a JavaScript audio synthesis library, and *Interface.js*, a JavaScript library for designing GUIs oriented towards live performance.

Charlie is currently a PhD candidate in the Media Arts and Technology program at UC Santa Barbara, where he works designing collaborative interfaces to scientific simulations and artistic installations.

Learn more at: <http://www.charlie-roberts.com>

Relevant Links:

Gibber : <http://www.charlie-roberts.com/gibber> (Chrome & Safari 6+)

Gibberish: <http://www.charlie-roberts.com/gibberish> (Chrome, Safari 6+, Mobile Safari, Firefox)

Interface.js: <http://www.charlie-roberts.com/interface> (Chrome, Safari 6+, Mobile Safari, Firefox, IE 10)

Timbre.js : <http://mohayonao.github.com/timbre.js/>

Audiolib.js : <http://audiolibjs.org>

Node.js : <http://nodejs.org>