NTNU
Norwegian University of
Science and Technology

MCT4048: Audio Programming

The Extensions: Dealing with Interactivity et al.

Anna Xambó

Department of Music, NTNU

12 February 2019

Start setting up...

Download:
https://github.com/axambo/audio-programming-workshop/

Go to: code/d5/00-setting-up/checklist.md

Warm-up Activity

Quizz: Week 1 Recap

Feedback Assignments

— WAC paper presentations
— Projects on GitHub
— Blog posts

This Week: The Extensions (40% Group Work)

— **Syllabus**: https://uio.instructure.com/courses/17406
— **Assignment 4** (Total grade: 30%): Presentation mini-project 2 (group) – days 6 (February 13, 2019) (10%), 7 (February 14, 2019) (10%), 8 (February 15, 2019) (10%)
— **Assignment 5** (Total grade: 10%): Written blog post about the mini-project 2 (group) – February 22, 2019

Program: Day 5 – 12 February, 2019

— 9.15-10.00: Setting up computers with the tools for the tutorial + Recap last week
— 10.00-12.30: Tutorial: Dealing with interactivity et al.
— 12.30-13.00: Lunch break
— 13:00-13:30: Organization of groups
— 13:30-16:00: Mini-project 2 development (1/4)

Learning Outcomes

— Get a sense of more advanced techniques of audio synthesis related to user interaction.
— Get familiar with the MIDI protocol and the use of MIDI in the browser.
— Be able to work in a group project relating audio programming concepts and building up from previous knowledge.
— Be aware of best practices in web development in group projects.

Arrays in JavaScript

Creation of an array: `fruits = ['Apple', 'Banana'];`
`fruits = [];`
`fruits[0] = 'Apple';`

Access into the first element of the array:
`fruits[0]`

(Optionally) Loop over the array using `for` or `while`.

The Convolver Node

— It is possible to record the ambience of a place and apply it to any digital audio signal.

— Impulse response is a *special file* that stores this information.

— With the convolver, you can apply the reverberation characteristics of a room to audio input sources by referencing an impulse response.

ConvolverNode

The `ConvolverNode` performs a linear convolution on a given audio buffer, often used to achieve a reverb effect.

```
AudioContext.createConvolver();

ConvolverNode.buffer
```

https://developer.mozilla.org/en-US/docs/Web/API/ConvolverNode

Amplitude Modulation vs. Frequency Modulation

MIDI

— Musical Instrument Digital Interface (MIDI) stands for a technical standard that describes a communications protocol, digital interface, and electrical connectors that connect a wide variety of electronic musical instruments, computers, and related audio devices.

— MIDI carries event messages that specify different musical aspects, including notation, pitch, and velocity.

— The activation of a particular note (Note On message) and the release (Note Off message) of the same note are considered as two separate events.

— The velocity event determines how loud it plays relative to other notes

The Web MIDI API

— It works on all platforms and devices. It also works with your existing MIDI setup.
— It is accessible anywhere.

Organization of groups: Brainstorming

Mini-project development (1/4)

You are expected to create a mini-project in teams that should be doable within a week. The overall aim is to explore a little bit further Web Audio. Here are different approaches that you can take:

— Develop an idea based on what we are seeing in class. Feel free to build up everyday, or change if not convinced (from scratch approach).

— Adapt an existing code to your needs and document what are the changes (remake approach).

— Combine projects from last week (hybrid approach).

— Other?

Working style

— Work with the same team throughout the week, ideally across campuses.
— Make sure to clarify who has developed what part of the code. For example, divide the work into functions and add the author name at the header of each function.
— The instructors in both sites will keep an eye on the groups to catch up.
— There will be 4 time slots during the week to work on the project.
— Keep a research journal.

Relevant Links

— Syllabus: `https://uio.instructure.com/courses/17406/pages/syllabus`
— GitHub slides & code: `https://github.com/axambo/audio-programming-workshop`