



Norwegian University of
Science and Technology



MCT4048: Audio Programming

The Extensions: Dealing with Interactivity et al.

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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 – 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`