

21M.380 MUSIC AND TECHNOLOGY

SOUND DESIGN

FINAL PROJECT, PART 2 (FP2)

RESEARCH AND MODEL

DUE: WEDNESDAY, APRIL 13, 2016, 9:30AM
SUBMIT TO: MIT LEARNING MODULES ▶ ASSIGNMENTS
5% OF TOTAL GRADE

1 Instructions

Based on a self-guided research process that you will conduct over the next two weeks, create a detailed model of the sound or acoustic scene that you will implement as your final project.

2 Context

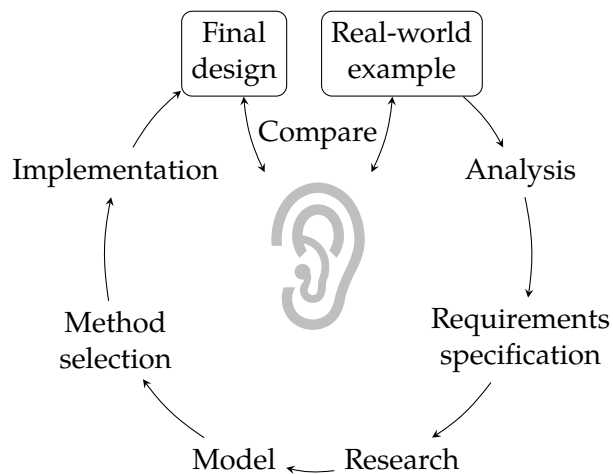


FIGURE 1. Stages of the sound design process (after Farnell 2010, figs. 16.7, 16.1)

We have been following Andy Farnell's methodology for a systematic approach to the sound design process (cf., figure 1). While the objective for your earlier FP1 assignment was to complete the analysis and requirements specification stages of this process, the present FP2 assignment addresses the research and model making stages of the proposed workflow.

3 Guidelines

Farnell (2010, secs. 16.4, 16.5, 16.6) discusses the research and model making stages of the sound design process in some detail. Start your work on this assignment by reading these 5 pages in the book (plus section 16.2, if you haven't read it already).¹ Farnell also provides practical examples of many specific sound design problems,² and chances are that some of them relate directly to your own project. Browse the book's table of contents and identify and study chapters that might be relevant to your work.

¹ Figures 16.3 and 16.4 from the book are particularly informative.

² Farnell 2010, chs. 23 ff.

3.1 Research

- Think about your final project in terms of an engineering problem. The main objective of the model that you will create is to break down a complex sound design problem into smaller, more digestible chunks and do research to gain insight into each individual part.
- While the final outcome of this assignment will be a written description of your model, the research phase preceding it is just as important. Make sure you devote sufficient time to it throughout the two weeks that you have for this assignment! This process will likely involve:
 - Looking up information in the MIT libraries (e.g., on the acoustic behaviour of a specific sound source)
 - Collecting specific documents (e.g., official standards or specifications)
 - Conducting soundwalks and field recordings with a handheld Zoom H4n recorder for later analysis (e.g., spectrograms, analysis of dominant pitches, etc.)

3.2 Model making

- The final model should describe the components of your design in sufficient detail for another sound designer to implement it in a programming environment of their choice. Imagine you are a sound designer who needs to implement this sound solely from the information contained in your document.³ What information would *you* like to see (or not) in such a document to make this process as flawless as possible, and how should this information be presented? Which information is best conveyed through text? Which through graphics?

³ In this respect the document you are submitting for FP2 should be self-sufficient. Do *not* assume that whoever reads it has access to your previous submission for FP1 or knows which sound you actually want to recreate.

- Clearly distinguish which sections of your document contain useful background information (which stems from the analysis and research phases of your project, but is not strictly needed for someone to implement your model) and which contains the actual model that would allow someone to implement your model.
- The question of which sound synthesis methods to use for which aspects of your model, and how to implement these in Pd, should not concern you too much yet for this assignment. Although you may indicate how you intend to solve specific problems in the context of Pd the model should remain portable between different synthesis techniques, programming languages, and digital signal processing systems.⁴
- Which control parameters does your model require? Which of those should be exposed to the user, and which should be computed 'behind the scenes'? Farnell has some good ideas with regards to the parameterization of sound design models and implementations.⁵
- The geometric model (cf., figure 2) and block diagram (cf., figure 3) that we have been developing in class for the steam train drive-by can serve as an example for your own project. Not every sound design problem can or needs to be expressed in geometric terms, but a block diagram is almost always a good idea.

⁴ cf., Farnell 2010, sec. 16.2.

⁵ *Ibid.*, sec. 16.9.

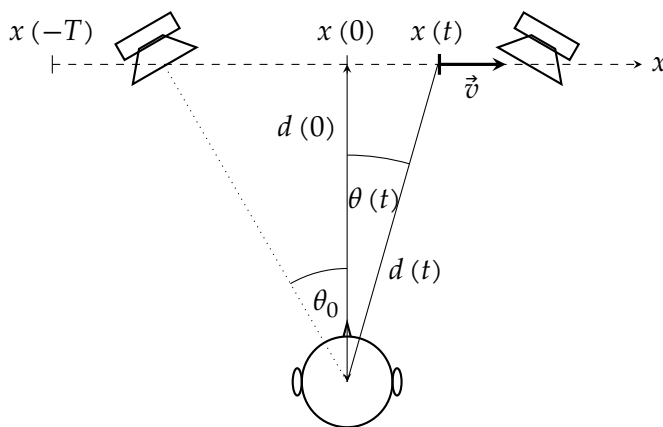


FIGURE 2. Geometry of steam train drive-by

4 Assessment criteria

This assignment will primarily be evaluated in terms of two main factors:

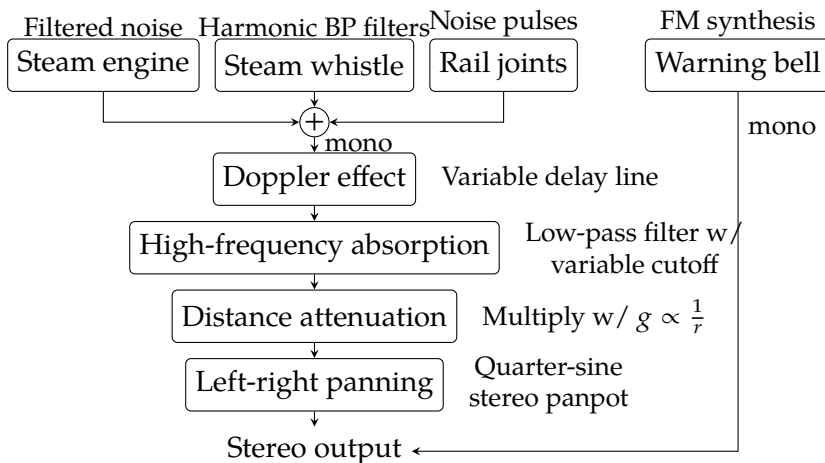


FIGURE 3. Block diagram of steam train drive-by model

Creativity demonstrated in the research process. Have you consulted sources other than Google to find out more about the sound(s) you are trying to recreate? Have you identified and researched previous work in the same area? Have you done field recordings to analyze the sound that you'd like to model? Perhaps your project requires knowledge from academic disciplines other than your own. Have you consulted people (e.g., student peers) from those disciplines to gain more insights?

Quality of the resulting model. How easy would it be for a sound designer to implement the target sound solely from the model described in your submission document? Is the information in your document presented in a manner that facilitates this process? Does the document serve as a useful reference to go back to during the method selection and implementation phases of the sound design process?

5 Submission format

Submit a written description of your model as a single .pdf file (2000 words max). Include block diagrams and other figures as you see fit. You can supplement your submission with audio files, if you refer to them in your document and they are not larger than 10 MB in total (use a compressed audio file format if necessary).

References and useful resources

Farnell, Andy (2010). *Designing Sound*. Cambridge, MA and London: MIT Press. 688 pp. ISBN: 978-0-262-01441-0. MIT LIBRARY: [001782567](#). Hardcopy and electronic resource.

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