



Semester description

General information about the semester

Semester: SMC8, 2nd semester, B.Sc. in Medialogy

School: [School of Information and Communication Technology](#)

Study Board: [Study Board of Media Technology](#)

Period: 1 February 2016 — 30 June 2016

Study plan: http://www.sict.aau.dk/digitalAssets/101/101055_94332_kandidat-lyd--og-musik.pdf

Year of approval of study plan: 2014

Semester theme description

Title: Music Information Research or Sonic Interaction Research

The focus of the semester depends which of the two project modules the students choose: “Music Information Research” (MIR) or “Sonic Interaction Research” (SIR).

If the students choose MIR, they will explore the development and analysis of practical and automatic methods for making the information contained in abstract formats of music, such as symbolic (sheet music), or digital audio samples (MP3) accessible. In other words, they will investigate how this information is extracted automatically as opposed to a manual approach that requires experienced human to extract the information.

If the other project module, namely SIR, is chosen, the focus is on exploration of the field of sonic interaction design. More specifically, the students should focus on one of the following applications: 1) interactive product sound design, 2) sonic interactions in arts, 3) interactive sonification.

The theme of the semester allows the students to get more in-depth and built upon some of the topics from the 1st semester in SMC. Depending on the project module choice, the focus will be more on either the music information or sonic interaction aspects. The project will mutually benefit from the courses in “Realtime Interaction and Performance”, “Sound and Music Signal Analysis”, as well as an elective course from either Medialogy, the music department or acoustics.

Semester organization

The semester is comprised of a 15 ECTS group based project module and three 15 ECTS course modules.

A range of project proposals will be presented at the semester start as a foundation for group forming and choice of project. Both projects within music information and sonic interaction research will be available. Groups can also develop their own project proposals in collaboration with an appointed supervisor. Some project proposals are in collaboration with external partners, mostly Danish companies, but projects of a more research-oriented nature are also encouraged. The project builds upon the skills acquired on the 1st semester in SMC, and narrows down the focus to either music information research or sonic interaction research depending on the students’ choice.

The courses offered this semester that support the project are: “Realtime Interaction and Performance”, “Sound and Music Signal Analysis”, and an elective course from either Medialogy, the music department or acoustics. The “Realtime Interaction and Performance” course introduces the students to both conceptual and technological concepts in relation to real-time interaction, which are important tools in the interaction design aspects of projects in sonic interaction research in particular. The “Sound and Music Signal Analysis” course provides the students with tools for analyzing sound and music signals and extracting important parameters characterizing the sound, which, eventually, are useful especially in projects within music information research.



AALBORG UNIVERSITY

Semester coordinator and secretary

Aalborg: Jesper Rindom Jensen (coordinator), Inaam C. Ramløse (secretary)

Copenhagen: Cumhur Erkut (coordinator), Judi Stærk Poulsen (secretary)

Esbjerg: Not offered.



Project module description

General module information

Title: Music Information Research

Type: Project module

ECTS points: 15 ECTS

Period: 1 February 2016 — 30 June 2016

Placement

2nd semester, M.Sc. in Sound and Music Computing

Module coordinator

Aalborg: Jesper Rindom Jensen (coordinator), Inaam Ramløse (secretary)

Copenhagen: Stefania Serafin (coordinator), Judi Stærk Poulsen (secretary)

Esbjerg: Not offered.

Academic content and relationships to other modules/semesters

The formal study plan description of the module can be found here (page 13):

http://www.sict.aau.dk/digitalAssets/101/101055_94332_kandidat-lyd--og-musik.pdf

The purpose of this project module is to explore the development and analysis of practical and automatic methods for making the information contained in abstract formats of music, such as symbolic (sheet music), or digital audio samples (MP3) accessible. In other words, how this information is extracted automatically is investigated, whereas it currently requires experienced human to extract.

Examples of use cases where such analysis and extraction from musical signals are relevant are in, e.g.,

- inferring or identifying the artist and song playing in a noisy environment like a pub (c.f. Shazam),
- organizing a music collection by genres (e.g., blues and/or hip hop), mood (e.g., restful or excited), or use (e.g., relaxation or exercise),
- determining the instruments playing in a recording (e.g., guitar and gong),
- determining the recording type (e.g., live or studio),
- (un)recommending music (e.g., “if you like Gustav Winckler, then you will not like L.O.C.”),
- creating playlists (e.g., “suggest a mix of songs from my collection for my new girlfriend”),
- composing new music (e.g., “mash together this Gustav Winckler song and that L.O.C. song”),
- automatic mastering (e.g., “what changes do I need to make to my song to make it more Pop-sounding?”),

and so on.

Objectives and learning goals

A number of objective and learning goals must be achieved in completion of the project module. First, the students must be able to describe, analyze, and compare different methods for classification, retrieval and description of content in audio and music signals, and to make qualified choices between such methods for different practical scenarios. Additionally, the students must be able to describe the structure and components of systems performing these tasks. The students should also be to explain the concepts behind other complex systems for working with audio and musical signal content such as sound search engines, query-by-humming or –example, music identification through fingerprint comparison, speech-driven menu systems, etc. Moreover, the students must be able to discuss and evaluate these complex systems.

It is also required that the students can understand, and analyze approaches and algorithms in relation to music information research from scientific literature, and that they can identify and interpret any



assumptions made. The students must also be able to implement such methods and evaluate their implementation against the original work. In relation to this, the students must be able to judge the quality of a recent piece of literature in music information research (e.g., journal or conference paper) in terms of relevance, solution, contribution, etc.

The students should also be able to distinguish between supervised and unsupervised learning, and how these learning types are used in music information research. Moreover, they should be able to identify and describe different representations of sound and music (low-, mid-, and high-level). In the courses, the students will be introduced to human perception, and the students must therefore be able to summarize the importance of this in relation to music information research. In the project dissemination, the students must also show their ability to summarize and distinguish between relevant experimental designs and figures of merit.

Extent and expected work load

15 ECTS problem-based project work in groups with supervision.

Pre-requisites for participation

The prerequisites for the module are the successful completion of the mandatory courses on previous semesters of the M.Sc. program in Sound and Music Computing as well as the previous project modules.

The prerequisites for participation are listed in the study plan:

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Examination

The module is examined through a standard group-based project exam. See the study plan for any further detail on requirements, examination and assessment:

http://www.sict.aau.dk/digitalAssets/101/101055_94332_kandidat-lyd--og-musik.pdf

It is a prerequisite for being allowed to take part in the project examination, that the project documentation is handed in on time (see [exam rules](#)).



Project module description

General module information

Title: Sonic Interaction Research

Type: Project module

ECTS points: 15 ECTS

Period: 1 February 2016 — 30 June 2016

Placement

2nd semester, M.Sc. in Sound and Music Computing

Module coordinator

Aalborg: Jesper Rindom Jensen (coordinator), Inaam Ramløse (secretary)

Copenhagen: Stefania Serafin (coordinator), Judi Stærk Poulsen (secretary)

Esbjerg: Not offered.

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The purpose of this project module is to explore the field of sonic interaction design with a focus on one of the following applications: 1) Interactive product sound design, 2) sonic interactions in arts, 3) interactive sonification. Students are required to perform an evaluation of the perceptual and/or cognitive aspects of sonic interactions from a human centered perspective.

Objectives and learning goals

A number of objective and learning goals must be achieved in completion of the project module. First, the students must be able to describe sonic interaction design as a field; analyze, and compare different theories behind the generation of sonic interactions. Then, the students must be able to understand the ability to use sound to provide information, in addition to the principles of music perception, cognition, and action.

It is also required that the students can apply their knowledge in the design of an application, where interactive sound plays a salient role. This application can be in art, interactive product sound design, or interactive sonification. They must be able to apply their knowledge in human sound perception and cognition to the evaluation of the proposed solution.

The students should finally be able to evaluate the application they propose from a human centered perspective, and this way, produce new knowledge and solutions.

Extent and expected work load

15 ECTS problem-based project work in groups with supervision.

**Pre-requisites for participation**

The prerequisites for the module are the successful completion of the mandatory courses on previous semesters of the M.Sc. program in Sound and Music Computing as well as the previous project modules.

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