Course Module Description

General module information Title: New Interfaces for Musical Expression Type: Course module Language of instruction: English Location of the lecture: Campus Copenhagen ECTS points: 5 ECTS Period: 1 September 2022 — 31 January 2023

Placement
1st semester, M.Sc. in Sound and Music Computing

Module coordinator
Dan Overholt (coordinator), Judi Stærk Poulsen (secretary)

Academic content and relationships to other modules/semesters
The formal study plan description of the module can be found here:

https://moduler.aau.dk/course/2021-2022/MSNSMCM1203?lang=da-DK

This course focuses on real-time interaction with New Interfaces for Musical Expression (NIMEs) from both conceptual and technological perspectives. Conceptually, we study the rich and expressive real-time human-machine interactions of musical interfaces, giving an overview of the area of research. We study the concepts of 'instruments', 'controllers' and 'mappings' in depth, within musical contexts: performances, productions, installations, and pedagogy. Essential technologies such as programming languages for synthesis and effects, Digital Signal Processing (DSP), embedded hardware platforms, interactive sensors and actuator technologies, and real-time communication protocols are studied and applied within course mini-projects.

Objectives and learning goals
Knowledge

- Understand the concept of real-time interaction and performance
- Knowledge on the history and taxonomical study of musical instruments
- Understanding of the concept of musical controller, mapping, and feedback
- Understanding real-time human-computer interaction in a musical perspective
- Understanding protocols of real-time communication in music technology systems

Skills

- Apply knowledge to the design of an instrument or interface for musical expression

Competences

- Apply appropriate methods and theories for real-time interaction to the design of a novel interface for musical expression

Extent and expected workload
The total workload is 5 ECTS. The course is organized as lectures with exercises, as well as hands-on workshops and individual and group project work. The mini-project is allocated 2 ECTS, lecture preparation and exercises 2 ECTS, and 1 ECTS for workshops.

Pre-requisites for participation
See the module description (find the link above) for any further detail on pre-requisites.

Examination
Modality and duration:
Individual oral exam based on submitted project. The duration will be 15 minutes followed by 5 minutes deliberation (20 minutes per student).
Assessment: In accordance with the 7-point grading scale.
Pre-approved aids: Mini project report and slides for presentation of same.

Prerequisites for participation:
Report, code, and presentation must be handed in before the specified deadline.

Further detail on the exam:
After presentation of the mini-project, the examiner will ask follow-up questions within the topic of the mini-project and the entire curriculum. The mini project is used as a foundation for the discussion, and evaluation will be made holistically based upon the presented work and exam performance. The presentation must include a real-time demonstration of the mini-project and a set of slides for presenting the project and its background.
Note: To attend the exam the report, code and presentation have to be handed in via Digital Exam, along with a ZIP-File containing all the technical materials needed by the teacher in order to evaluate the consistency of the students' work (files used in the realization of the mini-project, like CAD files, code for embedded platforms and system design diagrams).

The grade will depend on the presentation, and the ability of the student to answer questions in relation to the project and the course contents in relation to both theory and practice. The oral exam will particularly focus on evaluating the students'

- Submitted mini-project and report, as well as theory and knowledge from the lectures.
- Methods for designing interactive sensor/actuator systems, musical human-computer interfaces.
- Ability to apply skills and methods for designing and evaluating New Interfaces for Musical Expression, such as programming embedded audio synthesis and effects, designing physical interfaces, and/or developing augmented performance systems.

Information concerning the mini-project:
The mini-project can be individual or group-based, and the topic can be chosen after final approval by the teacher. To document the process and final result of the mini-project, students will have to hand-in a written report (max. 10 pages + references) and all technical documentation. The report should include the motivation, related work, and the iterations of the prototype, following the provided template. The prototype should involve real-time interaction and performance in a musical context, and the student must prepare a demonstration of the real-time interaction system and a set of slides for presenting the project and the background theory. All source code and any hardware design files used in the project must be available at the exam. To attend the exam, the report, code, and presentation must be uploaded before the specified deadline. Failure to comply with the requirements specified here will result in a failed grade.