MCT4054 – Examination Guidelines

About the course, syllabus, and learning outcomes.

Portfolio Exam (Semester project)

The exam is a portfolio of selected assignments, including the deliverables of individual semester project, such as a live demonstrative performance, technical documentation and a paper of approximatively 4000 words. The project consists in the design and implementation of a complete and real-time prototype of an interactive music system.

To qualify for the exam, students must participate in at least 8 of the first 10 workshops, and complete with a Pass grade all mandatory assignments by the cutoff date.

The following assignments are part of the portfolio: A2, A3, A7, and A8. However, also A4, A5 and A6, may have a significant impact on the quality of your project, and therefore on the grade you get in this course.

Requirements & Submission

Submit a single ZIP for A2, A3, A7, and a PDF file for A8.

The ZIP file must include:

- One subfolder for each assignment (names A2, A3, A7).
- Each subfolder must include the files specified in the requirements of the associated assignment.
- Include a Readme.txt file with:
    - URL of your A2 Blog Post
    - URL of your A7 Blog Post
    - Changes you have made, if any, with respect to the assignments you have submitted early in the semester (only for A2, A3, and A7).

If the zipped file exceed 1GB, remove large files and include in the Readme.txt a a download link and explain to which assignment they are associated.

Project Requirements

You are required to *design, implement, assembly, document, evaluate,* and *perform* with the prototype of an Interactive Music System (IMS) such as an instrument for musical performance (individual or collaborative), an extension/augmentation of an existing instrument, an interactive sound installation, a system for musical training, etc. The IMS (design, concept, principles, theories, techniques, etc.) must be *related* or *supported* by a minimum of 10 articles (conference papers or book chapters), 5 selected from the course readings/references and 5 sourced independently. The IMS must be implemented only with the tools used in this course (i.e. Bela using Pure Data with provided electronic parts), feature at least 2 types of input modality (i.e. use 2 different types of sensor), work in real-time as a standalone device (i.e. not connected to a computer). You are free to apply sensors on/in objects or instruments that are available to you, or that you can source/fabricate within the

campus facilities. You are not allowed to use (unless approved) electronic parts other than those in the provided hardware kit and those available upon request.

Projects are decided by the students and must be **approved** by the course responsible. Students receive the approval as a feedback on assignment A4. Students must seek for a new approval in case of major changes. The IMS is described in an academic paper and associated technical documentation must be submitted as well. IMS are showcased at the end of the semester in a short live demonstrative performance.

The project is part of a set of **individual** assessment tasks, that will be graded individually. However, you are allowed to team up to design instruments that complement each or that communicate with each other (e.g. hence perform as a duo or as a larger group), or individual components of a larger installation. However each part must be compliant with the project requirements, must work as a standalone system even in absence of the other parts, and still be somehow meaningful as an independent IMS.

Assignment A2

Write a critical review of an IMS system of your choice, and publish it on the MCT Blog under the section "Interactive Music".

- The selected IMS should be not commercial (i.e. closed design) and described (at least) in one or more conference paper or journal articles, which you must read and reference in the blog post.
- You are free to take the perspective you prefer when critically reviewing the selected IMS (i.e. not a simple summary of the selected paper). However, the perspective (one or multiple) should be strictly related to the topics covered in this course (e.g. review the IMS against theories, techniques, approaches, etc. included in the mandatory reading).
- You are not allowed to review IMS presented in the the first lecture. If you are not an MCT student, you can post the review on your blog or get access to the MCT blog and learn how to use it.
- The post must be multimedia rich (i.e. include images, audio, videos, hyperlinks), the length should be 1000 words (-/+ 10%). The post must be compliant with all MCT blog posting guidelines.

Submit the URL of your published blog post.

Assignment A3

Design, implement and preliminary evaluate a Bela-based IMS with:

- I/Os
  - 2 Axis Thumb Joystick with Select Button (refer to GitHub for the breadboard circuit)
  - Mono sound output

- Functionality
  - The Joystick (two axis and select button) control an arbitrary sound engine with arbitrary mapping.

    - The sound should be generated by synthesis only, i.e. it is not allowed to process and/or use audio acquired externally, such as pre-recorded sound samples, or the live audio input.
    - All Joystick signals must be acquired at signal rate, and never converted to messages (i.e. snapshot~) throughout the whole mapping and synthesis data flow. This implies that most PD objects processing messages won'/can't be useful.
    - The mapping must be more complex than three one-to-one relationships with synthesis parameters.

- Documentation
    - The Bela project Pure Data patch should be rich of comments explaining how IMS functionalities are implemented, and in particular
        - Detail the sound engine, the type/approach of synthesis or sound generation, how you have designed/implemented it, and which control parameters you have selected to "expose" for control, which are fixed.
        - Detail the mapping, how input signals are processed to (eventually) extract gestural information (i.e. gestural controller), and how these signal control the sound engine.
    - Produce a video recording of the working prototype (something simple and quick, max 5 minutes, recorded with your smartphone) showing:
        - A quick explanation/walkthrough of the functionalities of the IMS (without showing the patch) focus on the input/gesture to sound relationship.
        - A short performance with the system (one to two minutes).
        - Reflections and personal evaluation of the IMS, including the design process/iterations/challenges of the sound engine and mapping (i.e. how did you land on that design, how far it is from your initial idea, anything in particular that worked well or failed very badly); how usable and interesting/appealing the IMS is in your opinion and whether there is an artistic (personal) value in it; reflections/consideration on any other aspect you wish to include; try to formulate your reflections in close relationship to all material covered in this course (theoretical and technological); you can video record your PD patch while talking over and/or use the IMS while explaining concepts.
        - The circuit in case you have implemented something different than the one in GitHub.
        - Anything you source elsewhere (ideas, code, etc.) must be clearly stated in the Pure Data patch and in the video.

Submit a single ZIP file including:

- The Bela project (download the zipped project from the Bela IDE)
- The recorded video

Assignment A7

Describe the IMS you have developed in a short non-academic article and post it on the MCT Blog under the section "Interactive Music".

- The post must briefly describe the IMS you have designed and implemented, as well as its key features.
- The post must include a demonstrative video in which you (or someone else) perform with the system. It is not necessary for the performer to be recognizable and/or visible (i.e. you can crop or blur the face if you prefer). The IMS used for performing should be a standalone wire-free device (i.e. not connected to a computer or power sources). The 29th November concert will be audio-video recorded, and the recordings will be shared with you on the day itself (you can edit this material instead of planning for another recording session).
- The post must include your personal reflections as instrument builder and performer (e.g. design iterations, technical challenges, evaluation, learning and engaging with the instrument, composing music for this instrument, practicing, potential for long term development, affordances and intimacy, expressivity, etc.).
- If you are not an MCT student, you can post the review on your blog or get access to the MCT blog and learn how to use it.
- The post must be multimedia rich (i.e. include images, audio, videos, hyperlinks), the length should be 1000 words (-/+ 10%). The post must be compliant with all MCT blog posting guidelines.

Document the IMS you have developed.

- Submit a zipped file including design files and technical documentation to replicate the system (e.g. functional diagrams, circuits, PD patches, dependancies, assembly instructions, list of materials, technical notes, etc). Files should be well organized and commented (especially PD patches) to an extent that another student can easily re-assemble the system, understand how it works, and eventually modify it. Make sure that you give credit to others in case you have taken code, ideas, libraries, etc. elsewhere. You may be called in to explain unclear aspects of your submission. If you want, you can also make this material available through the blog post (but you still have to submit it here as well). For example, you can either link your own GitHub repository where all files are archived, or make the zip file available for download (store it where large files are allowed, do not store it not under the MCT Blog main GitHiub repository!).

Submit a zipped file including source code and technical documentation of your IMS. Include also a Readme.txt file that includes the URL of your published blog post.

Assignment A8

Describe the IMS you have designed, implemented, evaluated and performed with in a short academic paper.

- The paper must be formatted according to the NIME 2024 two column paper templateLinks to an external site. (you can skip the ethical statement if you wish).
- The paper must have a length of approximately 4000 words (-/+ 10%). Note that the word count includes only the main body text, i.e. title, abstract, keywords, ethical statement, and references are excluded.
- The paper must include at least 10 references (at least 5 independently sourced and described in Assignment 4 and at least 5 from course readings).
- The paper should be written in appropriate academic language.

- The paper should integrate images, diagrams, charts and/or tables supporting or complementing the body text (screenshots of design files are not recommended).
- You are free to organize and balance the contents of the paper as you find most appropriate (which may also depend on the specific IMS you have developed). However, it is recommended that your paper includes (in any reasonable order or combination):
    - short abstract;
    - introduction explaining key features and motivation;
    - related works and/or supporting theories/principles;
    - design of the IMS and details of the sub components;
    - implementation of the IMS (there is no need to be too detailed here as you have also submitted all design files and technical documentation);
    - evaluation of the IMS including method and results;
    - conclusion including a summary of your original contributions.

Assessment Criteria

Assignments included in the portfolio will be graded using the A-to-F scale, and weighted as follows to compute the final grade:

- A2 10% - Critical review of an independently selected IMS published on the MCT Blog.
- A3 10% - Design, implement and preliminary evaluate a Bela-based IMS with given I/O constraints.
- A7 & A8 30% - Extent to which the paper (primarily) and the blog post describe and evaluate the IMS with respect to theories, methods, principles, and existing works in the field.
- A7 & A8 30% - Conceptual and technical sophistication of the IMS design and its implementation.
- A7 & A8 10% - Design files and technical documentation.
- A7 & A8 10% - Presentation style and organization of paper and blog post.