Pedagogical Approach for the Session on 23/01/23

Acompanying URL: https://tejaswineek.github.io/

This lecture and course will take the pedagogical approaches of *active learning* , *conversation-led teaching* , and *problem-based learning* . Some tools for active learning and conversation-led teaching that I will use are *forced-choice debate* , and *structured conversation* . For problem-based learning, I have planned a **task of creating rule-based music**

The threshold concepts relevant for this session are: Rule-based learning, Stochastic Novelty, AI and latent space, three types of Creativity: Combinatorial, Exploratory, and Transformational. These will be achieved through a series of demonstrations, and tasks.

Traditions and Subfields in Music Technology - Course Plan

At the end of the course, the student should able to:
1. Understand the design principles of music technological systems,
2. Learn about the core areas, and the history of the music technological development
3. Gain the ability to use tools and applications in various subfields

The course comprises of 12 lectures, 10 assignments, 4 conference-style tutorial sessions. The assignments will be peer-graded and will be formative. Each lecture would be 1 hour of teaching and 1 hour of activity.

Week	Module	Lecture	Tools	Assignment Due	Hours
1	Module 1: Acoustics, DSP, and Sound Synthesis	Lecture 1 : **Acoustics and Signal Processing** Sound analysis in SonicVisualizer, Understanding of analog and digital signal processing and its use in musical tools.	Sonic Visualizer	0	2
		Assignment 1: Work in Sonic Visualizer for understanding FFT, Spectrograms	Sonic Visualizer		6
2		Lecture 2 : **Microphones and Speakers** Principles of transducers, microphones, telephones, speakers and ambisonics	Soundcard, Microphone, Speaker	1	2
		Assignment 2: Make a new littleBits musical tune			6
3		Lecture 3 : **Sound Synthesis and Modeling** Understanding working principles of sound synthesis, oscillators, sequencer, filter, delay	Little Bits	0	2
		Tutorial 1 (8 hours prep + 4 contact hours): **DAFX**: This week the tutorial session will comprise of a student-led mock-DAFX conference, where students read and present classic papers from the conference for the session.	In-class presentations		12
4	Module 2: Music Psychology, and Interfaces	Lecture 4 : **Music Psychology, and Embodiment** Understanding basic principles of psychoacoustics, sound embodiment, and biometric interfaces	Video Analyzer	2	2
		Excursion 1: Tour to RITMO labs, motion capture labs, speaker arrays in the Portal, Anechoic chamber			4
		Assignment 3: Analyze musical motion through video-annotation	Video player, motion annotation		6
5		Lecture 5 : **Music Recording and Production** Structure and model of DAWs, Understanding the working principles of hardware components	Audacity / Reaper	3	2
		Assignment 4: Use audacity to produce of 3 musical sounds by modifying a single sound signal			6
6		Lecture 6 : **Computer Ensembles, and Networked Music** Understanding speaker arrays, computer music orchestras, principles of networked music performances	Audacity / Reaper	4	2
		Assignment 5: Jam through NinJam	Ninjam through Reaper		6
		Tutorial 2 (8 hours prep + 4 contact hours): **NIME**: This week the tutorial session will comprise of a student-led mock-NIME conference, where students read and present classic papers from the conference for the session.	In-class presentations		12
7	Module 3: Representation, Generation, and Retrieval	Lecture 7 : **Music Encoding and Metadata** Midi, and other encoding formats, music metadata and ontologies, song metadata and libraries	MuseScore	5	2
		Library Assignment: OWL / Wikimedia commons			4
		Assignment 6: Create and export a toy 'score' into MusicXML from MuseScore			6
8		Lecture 8 : **Music Information Retrieval** Learn about the classical problems in the field: Music fingerprinting, OMR, audio description, music encoding, and neural network-approaches	Shazam / Freesound / Soundhound	6	2
		Assignment 7: Break the limits of Shazam. Use the app in different conditions to figure out its limits (for example different volumes, talking over the music, etc). Write a short reflection on this (300 words).			6
9		Lecture 9 : **Live coding** Learning new approaches to music and sound creation through gibber and pd	Gibber, PureData	7	2
		Assignment 8: Create an alarm tone using Gibber			6
		Tutorial 3 (8 hours prep + 4 contact hours): **ARP** : This week the tutorial session will comprise of a student-led mock-ARP conference, where students read and present classic papers from the conference for the session.	In-class presentations		12
10	Module 4: Music, Society, and Technology	Lecture 10 : **Digital Music Forensics** Issues and analysis of music streaming data, genres analysis, music similarity through algorithms	Sonic Visualizer	8	2
		Assignment 9: Write a short essay (500) reflecting on creativity and novelty strictly within a genre of music			6
11		Lecture 11 : **Computational Music Creativity** Generative networks and heuristic methods for music creation, reflections about creativity	Web-audio based tools like GANHarp, DeepDrum, LatentCycles	9	2
		Assignment 10: Write a short essay describing your experimentation with these tools and more, reflecting on sharing creativity between you as a musician, and the computer			6
12		Lecture 12 : **Music Technology and Society** Understanding the relationships of algorithms to music cultures, accessibility, diversity, and ethics		10	2
		Tutorial 4 (8 hours prep + 4 contact hours): **ISMIR** : This week the tutorial session will comprise of a student-led mock-ISMIR conference, where students read and present classic papers from the conference for the session.	In-class presentations		12
13	**Exam**	**1. 50% Assignment Portfolio with 5 out of 10 assignments, and** **2. 50% In-Class Essay exam explaining a subfield specialization in a chosen area**	5 assignments chosen by the student will comprise a portfolio, accounting for 50% of the final grade, with 50% from an in-class essay exam.		4
	Sum (Hours)				**144**
	Other Alottments (Hours)	Compulsory Reading (Pensum) : 5 hrs X 680 pages = 136 hrs			
	Total	**280 hours (144 Teaching, Assignments, and Tutorials +136 Self study and reading)**			

Syllabus

Books:

Dean. (2009). *The Oxford handbook of computer music* (pp. VII, 611). Oxford University Press.

Holland, Wilkie, K., Mulholland, P., & Seago, A. (2013). *Music and Human-Computer Interaction* (1st ed. 2013.). Springer London.

Bader. (2018). *Springer Handbook of Systematic Musicology* (1st ed. 2018.). Springer Berlin Heidelberg : Imprint: Springer.

Beranek, & Mellow, T. J. (2019). *Acoustics : sound fields, transducers and vibration* (Second edition.). Academic Press.

Articles:

Webster, J. (2021). The promise of personalisation: Exploring how music streaming platforms are shaping the performance of class identities and distinction. *New Media & Society*.

Magnusson, T. (2010). Designing Constraints: Composing and Performing with Digital Musical Systems. *Computer Music Journal* 34(4), 62-73.

Kowald, Dominik & Müllner, et.al. (2021). Support the underground: characteristics of beyond-mainstream music listeners. *EPJ Data Science*.

Bongers, B. (2000). Physical interfaces in the electronic arts. *Trends in gestural control of music* , 41-70.