Pla Docent de l'Assignatura

Teaching Guide

Course name: Sound Creation Lab
Academic year: 2012-2013 **Course:** Third **Trimester:** Third

Degrees: Grau en Enginyeria en Informàtica (Optativa) i Grau en Enginyeria en Sistemes Audiovisuals (Optativa)

Course Code: 21493-21629
Number of credits ECTS: 4
Total number of hours: 100 hores
Language: English is our working language. Sessions by Jose Manuel Berenguer will be in Spanish.
Teachers: Emilia Gómez, Justin Salamon, Jose Manuel BerenguerHaga clic aquí para escribir texto.
Coordinator: Emilia Gómez Haga clic aquí para escribir texto.

1. Course description

Course name: **Laboratori de Creació Sonora/Sound Creation Lab**
Academic course: **2012-2013**
Course: **Tercer**
Trimester: **Tercer**
Estudis: **Grau en Enginyeria en Informàtica(Optativa) i Grau en Enginyeria en Sistemes Audiovisuals (Optativa)**
Course code: **21493-21629**
Number of credits ECTS: **4**
Number of hours: **100 hores**
Language: anglès i castellà (Jose Manuel Berenguer). Elija un elemento.
Teachers: Emilia Gómez, Justin Salamon, Jose Manuel BerenguerHaga clic aquí para escribir texto.
Coordinator: Emilia Gómez Haga clic aquí para escribir texto.

2. Course presentation

This course deals with sound recording, description, transformation and generation. We will work with sounds produced by humans, animals, sounds from the environment and sounds of music. We will learn how to record them, analyze and describe them, process them and use them in a creative way.

Prerequisites

To take this course it is desirable to have an engineering background, to have taken some courses in Mathematics at the undergraduate level, such as Linear Algebra or Calculus, and also to be familiar with basic signal processing concepts (related courses: Signals and Systems, Speech Processing, Audio and Music Processing). Programming experience is also desirable.

3. Competences

These are the competences we will work in the course according to the official description of the studies:

Competències transversals	*Competències específiques*
Instrumentals *G1. Capacitat d'anàlisi i síntesi* *G2. Capacitat d'organització i planificació* *G3. Capacitat per aplicar els coneixements a l'anàlisi de situacions i la resolució de problemes* *G4. Habilitat en la cerca i la gestió de la informació* *G5. Habilitat en la presa de decisions* *Interpersonals*	*Competències de tecnologia específica: Sistemes Audiovisuals* *AU6. Coneixements de les tècniques de tractament de senyals d'àudio i música. Desenvolupament d'aplicacions informàtiques basades en el processament de música.* *AU7. Adquirir el coneixement teòric i pràctic dels equips de mesura i reproducció del camp acústic* *AU12. Adquirir coneixements sobre la cadena de producció, post-producció i exhibició en projectes audiovisuals.* *AU34. Conèixer les tècniques i procediments d'enregistrament, generació i producció de continguts d'àudio i música. Aplicació pràctica dels*

G8. Capacitat de treball en equip *Sistèmiques* *G11. Capacitat d'aplicar amb flexibilitat i creativitat els coneixements adquirits i d'adaptar-los a contextos i situacions noves* *G12. Capacitat per progressar en els processos de formació i aprenentatge de manera autònoma i contínua* *Elija un elemento.*	*coneixements d'acústica, de processament de senyal i de sistemes multimèdia en la de senyal i de sistemes multimèdia en la creació de continguts sonors per a produccions audiovisuals.* *AU15. Adquirir los conocimientos básicos sobre el análisis de datos, estudiando sus regularidades, técnicas de predicción y algoritmos de clasificación.* *AU23 Saber decidir que sistema de codificación de audio y música debe utilizarse para una determinada aplicación.*

4. Contents

Theoretical concepts

Block 1: Introduction
- Course presentation. Introduction to soundscapes, freesound. Sound walk.

Block 2: Sound and creativity
- Usages of sound from a creative point of view (*Usos del sonido desde el punto de vista creativo*).
- Sound, cinema and publicity (*Sonido, cine y publicidad*)

Block 3: Technological foundations
- Sound description: timbre characterization
- Sound events & periodicity detection
- Sound similarity & classification
- Sound behavior generation (*Generación de comportamientos sonoros*)

Practical activities (labs)
- Lab1: Sound recording and tagging
- Lab2: Automatic description
- Lab3: Novelty & periodicity estimation
- Lab4: Sound classification
- Lab5: Sound generation

Group (project-based) activities (seminars)
- Seminar 1: Project definition
- Seminar 2: Gathering sound material: recordings, sound libraries, foley, synthesis.
- Seminar 3: Description of the sound material (manual, computational)
- Seminar 4: Sound transformations and generation

5. Course evaluation

100 points divided into:

- Final exam (40 pt) (*Recuperable al juliol*). Minimum of 5/10 is required.
- Lab reports and participation in class (30 pt) (*No recuperable*). Minimum average of 5/10 is required.

- Project: seminar activities, final presentation and concert (30 pt) (*No recuperable*). Minimum of 15 pt (5/10) is required. Those 30 pt will be devided into:
    - Concert mark (10 pt)
    - Project presentation & concert rehearsal (5 pt)
    - Seminar work (15 pt)

Basic rules for evaluation:

Labs

- Lab teams will have no more than 2 students.
- No code sharing is permitted between teams.
- Plagiarism of code or report material will result in 0 for the lab.
- Work will not be accepted after the submission deadline.
- Work has to be submitted in the format and structure specified in the lab instructions. Other formats will not be accepted.

Project

- Project teams will have no more than 4 students.
- Workload should be balanced between all students in a team and individual work has to be reported and justified during the term.
- Seminar presentations have to be shared between team members.
- Students that do not attend the project presentation, rehearsal and soundcheck (on the day of the concert) will not be allowed to perform and will have a 0 in the concert evaluation.
- Teams with an evaluation's score below 5/10 in the project presentation & concert rehearsal activity will not be allowed to perform in the final concert and will get a 0 in the concert mark.

6. Bibliography

Main references

- Gouyon, F. Herrera, P. Gómez, E. Cano, P. Bonada, J. Loscos, À. Amatriain, X. Serra, X."Content processing of music audio signals" In "Sound to sense, sense to sound:A state- of-the-art in Sound and Music Computing," Polotti P. and Roccheso D. (eds). Logos Verlag, Berlin GmbH, 2008 ISBN 978-3-8325-1600-0
- Ecological Acoustics Perspective for Content-Based Retrieval of Environmental Sounds. Gerard Roma, Jordi Janer, Stefan Kersten, Mattia Schirosa, Perfecto Herrera, Xavier Serra EURASIP Journal on Audio, Speech, and Music Processing 2010, 2010:960863 (5 December 2010)
- Nicola Orio: Music Retrieval: A Tutorial and Review
- Schafer, R. M.Our Sonic Environment and The Soundscape – The Tuning of the World, Destiny books, 1977.
- Farnell, Andy. Designing Sound, The MIT Press.

Complementary bibliography

- Chion Michel: La audiovisión: Introducción a un análisis conjunto de la imagen y el sonido; Paidos Comunicación.
- Rodriguez Angel: La dimensión sonora del lenguaje audiovisual; Paidos papeles de comunicación.

- Sonnensschein David: Sound Design: The expressive Power of Music, Voice and Sound Effects in Cinema; Michael Wiese Productions.

The moodle of the course will contain:

- Lecture material (slides and references)
- Lab instructions
- Seminar instructions
- Project material

7. Methodology

This is a practical course that will combine lectures, practical sessions (labs) and seminars. In the lectures, we will review the main theoretical concepts related to sound description, labeling, classification, transformation and synthesis and we will present a set of research and artistic projects related to sound design and sound processing.

In the hands-on sessions (labs), the students will perform guided work with computers. The labs should be carried out in teams of no more than two students. The labs will include working with recording devices, software (e.g. audacity, Pure Data, Sonic Visualizer) and programming some algorithms (e.g. in Matlab, Pure Data or Python). Students will present their results by a set of written reports.

In the seminars, the students will carry out an artistic project related to sound in small groups. The seminars will consist on tutoring sessions, project status presentation and final presentation and concert. Project will be carried out in teams of no more than four students.

Final exam: the student will be asked to discuss some of the topics of the course at a final exam.

Effort:

Topics	Teaching hours			Hours for personal work	
	Lecture group	Lab group	Seminar group		
1.Introduction	2	0	2	7	
2. Sound and Creativity	4	2	3	12	
3. Technological foundations	8	8	3	14	
4. Concert	4	0	0	14	
Project/exam preparation	0	0	0	17	
Total	18	10	8	64	100 hours (ECTS*25)

5. Activities

Teachers: Emilia Gómez, Jose Manuel Berenguer, Justin Salamon

Lectures

1. Course presentation. Introduction to soundscapes, freesound. Exercise: sound walk.
2. Usos del sonido desde el punto de vista creativo
3. Sonido, cine y publicidad
4. Sound description: timbre characterization
5. Novelty & periodicity description
6. Sound similarity & classification
7. Sound behavior generation / Generación de comportamientos sonoros
8. Rehearsal (all teachers present)
9. Final concert (all teachers present)

Practical sessions (labs)
Teachers: P101: Justin Salamon, P102: Emilia Gómez

Seminars (project)

Each group is initially coordinated by one of the teachers (S101: Justin Salamon, S102: Emilia Gómez, S103: Jose Manuel Berenguer). In the first session, students are organized into groups and seminar groups are created for the remaining sessions.

Week	Monday 8:30-10:30	Wednesday 10:30-12:30	Friday 12:30-14:30
1 08-12 apr	**8/04**	**10/04** Lecture 1: Introduction	**12/04** Lecture 2: Sound & creation
2 15-19 apr	**15/04** Lab1 (P101): Recording & tagging	**17/04** Lecture 3: Sound, cinema & publicity	**19/04** Lab1 (P102): Recording and tagging
3 22-26 apr	**22/04** Seminar 1: Project definition (S101-S102-S103)	**24/04** Lecture 4: Timbre	**26/04** Lab2 (P101-P102 overlap): Description
4 29 apr-3may	**29/04** Lecture 5: Novelty and periodicity	**01/05** HOLIDAY	**3/05** Lab3 (P101-P102 overlap): Novelty and periodicity
5 6-10 may	**6/05**	**8/05** Seminar 2 (S101-S102): Sound material gathering	**10/05** Seminar 2 (S103): Sound material gathering
6 13-17 may	**13/05**	**15/05** Lecture 6: Similarity and classification	**17/05** Lab4 (P101-P102 overlap): Classification

7 20-24 may	**20/05** HOLIDAY	**22/05** Lecture 7: Generation	**24/05** Lab5 (P101-P102 overlap): Generation
8 27-31 may	**27/05**	**29/05** Seminar 3 (S101-S102): Description	**31/05** Seminar 3 (S103): Description
9 3-7 june	**3/06**	**5/06** Seminar 4 (S101-S102): Transformation and generation	**7/06** Seminar 4 (S103): Transformation and generation
10 10-14 june	**10/06**	**12/06** Lecture 8: Project presentation & concert rehearsal	**14/06** Lecture 9: Concert

a. Activities list

Activitat	Data enunciat	Data lliurament	Data de lliurament de resultats
Lab1	15/04	25/04	10/05
Lab2	26/04	02/05	16/05
Lab3	03/05	16/05	30/05
Lab4	17/05	23/05	07/06
Lab5	24/05	31/05	14/06
Project presentation	10/04	12/06	13/06
Concert	10/04	14/06	15/06
Seminar	Each seminar	Each seminar	Each seminar