

# NIME Education at the School of Arts of the Portuguese Catholic University / CITAR

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**Abstract**—The liberalization of radio and television broadcast industry in Portugal and the recent flow of investment into the field of creative industries, together with exponential developments in communication technologies, resulted in a growing demand for professionals in the field of audiovisual production. The new Media Industry requires qualified human resources with strong skills in Artist, Technology, Culture and Ethics.

This paper presents some of the courses currently offered at the EA-UCP that have some degree of relevancy to NIME (New Interfaces for Musical Expression). Different professors, with different backgrounds (from arts and music to engineering), are responsible for each one of the courses, and some of the courses have in fact more than one professor, usually with different backgrounds, allowing to cover the different facets of more interdisciplinary curricular units.

## I. INTRODUCTION

The liberalization of radio and television broadcast industry in Portugal and the recent flow of investment into the field of creative industries, together with exponential developments in communication technologies, resulted in a growing demand for professionals in the field of audiovisual production. The new Media Industry requires qualified human resources with strong skills in Artist, Technology, Culture and Ethics. An Institution with such imperative social responsibilities as the Portuguese Catholic University (UCP) could not stand indifferent and, on an anticipation initiative, created back in 1997, at the Porto Campus, the first Portuguese University Degrees in the Sound and Image area of studies, offered by the School of Arts of the Portuguese Catholic University (EA-UCP).

The EA-UCP offers undergraduate studies (first and second Bologna cycles) on topics such as Music, Sound Design, Digital Arts, Cinema and Audiovisuals, Screenwriting Production and Computer Animation, as well as a postgraduate PhD programme on Science and Technology in the Arts (with two specializations: Computer Music and Interactive Art)<sup>1</sup>.

In addition, the EA-UCP incorporates the Research Center for Science and Technology in the Arts (CITAR)<sup>2</sup>. Founded in 2004, CITAR is an academic Research Center that fosters interdisciplinary collaboration and promotes theoretical and applied research in the creative production. The center has

extended its activities in 2007 from Digital Arts towards Music Studies, Theory of the Arts and Cultural Heritage Study, Conservation and Management. These different research groups, representing multiple disciplinary interests, have created a unique academic environment dedicated to envisioning an interdisciplinary dialogue between Arts and Science.

This multidisciplinary environment attracts students with different profiles. From students with a fine arts, music, audiovisual and design background, who see these degrees as an opportunity to get contact with technology and scientific topics (and whose profile currently represents the majority of our enrolled students), to science and engineering students, who look forward to learn how to put their technical expertise at the service of creativity and art.

## II. MATTERS

The EA-UCP offers, at each of its Sound and Image degrees, several courses with some relevancy for NIME. These courses cover topics related to sound design, sound processing, computer music and interface and interaction design, as summarized below, organized according to the different Bologna cycles of studies offered at the EA-UCP. In what regards the PhD degree (third Bologna cycle), all courses are provided following a seminar model, where the EA-UCP invites researchers and professors from all over the world with a relevant work in each of the covered topics<sup>3</sup>.

### A. First Bologna Cycle (3 years Licenciante degree)

- **Interactive Sound**
- **Art Project**

### B. Second Bologna Cycle (2 years Master degree)

- **Sound for Multimedia**
- **Tangible User Interfaces**
- **Multimedia Programming**
- **Final Project**

<sup>1</sup>For more detailed information see <http://artes.ucp.pt/>

<sup>2</sup><http://citar.ucp.pt/>

<sup>3</sup>For a complete list of the invited speakers that have so far visited EA-UCP in the scope of the PhD programme, please see <http://artes.ucp.pt/si/doutoramento/index.html#Doc>

### C. Bologna Cycle (3 to 5 years PhD degree)

- **Human-Computer Interfaces**
- **Tangible User Interfaces**
- **Interactive Music Composition**
- **Sound Synthesis and Processing**
- **Interactive Installations**

### III. MATERIALS

Different technologies are covered and explored in the scope of the courses presented in the previous sections, as well as in all research projects developed by CITAR researchers and our PhD students. The EA-UCP and CITAR are equipped with several computer labs and recording studios, and the list of devices available for work on NIME projects is extensive. Students are also encouraged to explore and get familiarized with various software platforms (from open source to commercial products [2], [3], [5], [4], [6], [1]), both as users and as developers.

### IV. METHODS

Most courses offered at the EA-UCP promote a combination of lectures and lab and practical work. Lecture sessions present the state of the art and introduce students to the base concepts in each field. These courses usually include reading assignments, which for the case of Master and PhD degrees, are a requirement for the writing of the “Related Work” sections of the corresponding dissertations and thesis. On the other hand, The lab sessions allow our students to have contact with the technologies involved in the creation of Digital Art projects, and apply the theoretical concepts presented during the lecture sessions.

Some specific courses (e.g. the Art Project during the 1st Bologna cycle, or the Master’s Final Project) are mainly practical, and the resulting work is expected to be presented publicly as a performance or art installation (for the case of our Master students, all works should be presented at the end of the second year at a major public that takes place at the main auditorium hall at the EA-UCP).

### V. CHALLENGES

Given the multidisciplinary context at EA-UCP/CITAR, and the different backgrounds of our students (some have a strong background in music or arts while others, although still the minority, have a stronger background in science and engineering), one of the main challenges faced on the previously presented courses is related to the various technical and programming levels of experience within a class. In classes where the students are expected to developed a final project to be publicly exhibited or used in a performance, the lack of technical and programming expertise sometimes becomes a strong handicap to the project development.

### VI. CONCLUSIONS

At EA-UCP we try to offer programming and more technical courses (some of them as extra curricular offerings) in order to help the interested students to overcome any

technical limitations. Another approach (mainly at the Master’s programme) is to form teams of students where we try to join students with somewhat different but complementary backgrounds, which usually allows to gracefully overcome both artistic/conceptual and technical limitations, with the added value of allowing students to work in a multidisciplinary team and have the experience of working with colleagues that have different backgrounds, and most of the time work methods, approaches, and even languages and concepts.

In this way, we attempt to avoid worst case scenarios that usually happen when students with a strong technical background completely fail at the conceptual level (their projects although presenting advanced and sophisticated technical or programming features lack originality or strong conceptual or artistic context), or when students that lack technical proficiency propose unfeasible artistic concepts that would (and have) ended in failed projects.

On the other hand, at CITAR and EA-UCP we have a team of researcher and professors from different scientific areas (that go from arts and music to engineering and computer sciences), allowing to form multidisciplinary teams that are in a good position to help and advise our students on their interactive digital art projects.

Some examples of the projects developed by EA-UCP students in the field of NIME are “SoLu - Multisensorial Hyperinstrument”<sup>4</sup>, developed by André Rangel (a EA-UCP PhD student), and “Dub-It”<sup>5</sup>, under development by João Soberano (a Sound Design Master student)<sup>5</sup>, which allows the use of a WiiMote for sound mixing interaction.

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<sup>4</sup><http://3kta.net/solu/>

<sup>5</sup><http://dub-it.blogspot.com/>