

ANEXO 2:

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DIGITAL SOCK

Study and Development of a Digital Musical Instrument

Slavisa Lamounier & Paulo Ferreira-Lopes
Portuguese Catholic University - EA
CITAR - Porto

ABSTRACT

The primary focus of this study is to develop a digital musical instrument, in which the sound is controlled by feet movements, called Digital Sock. This article describes the first procedures used to create the interface design.

In order to minimize possible discomfort during the handling of the gestural interface and enhance the action of the instrument during the performance, we performed an ergonomic analysis that preceded the choice of material for the construction of the prototype instrument.

For the ergonomic reflection, we took into account: a) the analysis of expressive gesture; b) the analysis of ergonomic evaluation criteria established by Bastien & Scapin (1993).

The methodology of the analysis of the expressive gesture was:

[1] to capture the gestures performed on motion capture laboratory (Motion Capture) School of Arts (Portuguese Catholic University), attended by a group of thirteen volunteers, men and women of different ages, and divided professionally in the following way: four musicians, five dancers and four with different activities;

² <http://zilmusic.com/musa2016/programme.html>

[2] to analyze the movements by means of biomechanical analysis (data interpretation), and psychological analysis (discourse analysis of the reporting experience).

The results of this phase were checked with the ergonomic evaluation criteria (Bastien & Scapin, 1993). These studies helped us to understand that the first step to ensure the usability and accessibility of the interface is the choice of the right material and project construction.

The option found was the use of e-textiles. The e-textiles is a part of "wearable" technology development. This kind of material has been used in products for different purposes, as they may be developed with a variety of conductive materials. Thus, we have chosen some assumptions for the development of our instrumental prototype: the comfort of clothing, ease of use, efficiency in handling (avoiding damage to the interface), flexible control and intuitive driving.

KEYWORDS

Musical Instrument Digital (DMI); Ergonomics; Gestural Analysis; Wearable Technology; E-textiles