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RUI PEDRO GONÇALVES FONTES

DESIGN DE SONS ÚTEIS PARA A EXPERIÊNCIA DO UTILIZADOR

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Orientador: Professor Doutor José Gomes Pinto
Co-Orientador: Dr. Fernando Nabais

Universidade Lusófona de Humanindades e Tecnologias

Escola de Comunicação, Artes e Tecnologias da Informação

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Abstract

The first part of this thesis defines the term 'design' as a branch of human knowledge with inherent methodologies. While knowledge, it proves to be as valuable as mathematics, philosophy or engineering, since it employs core processes and methods that originate in different disciplines (such as cognitive psychology, neurology and art, among others) which translate into specific skills of this knowledge. The definition of this concept is not consensual and its applications are constantly growing, which demonstrates the large amplitude that this word encompasses. However, it is possible to verify that their practitioners (designers) acquire concepts and motivations that are non-existent for others with only superficial notions of what ‘concept design’ is about.

The former statement is noted, for instance, during the act of building an object performed by two different persons, and in which only one of them has studied design theory. In this case it is possible to observe a large disparity to the project's approach, due to the concepts that one person has achieved while the other has not.

Despite this, several people share the notion that 'design' is a discipline that promotes harmonious synergies while, in reality, the main concern of a designer should be his/her response to a goal. This is achieved through the study of several project requisites in connection with a mental work that promotes goal fulfilment and with the assistance of several disciplines, in order to meet the purpose to which it is being constructed.

It is because of the above reasons that we are trying to oppose the idea that design is merely an aesthetic exercise, a notion that attaches this discipline a shallow and superficial connotation. As a counter point to this latter idea we will present a few general approaches to the exercise of this 'doctrine', which also govern its experience. Preferably, this should be oriented by a goal or an intention to solve a problem.

With the evidence that new digital interfaces will use consistently more means to present information, in the second part of this work we intend to show how sound can be used as an asset in an interactive interfaces’ project.

Sound is defined as the cognitive perception of vibrations, and any perceived oscillation may be used in the construction of meaningful messages. Due to its characteristics, sound plays a significant role in perceiving the world, and we believe that its use in interactive applications facilitates several advantages. In this way, we apply the 'general principles of

design' (acquired during the initial chapters of this project) to this media, while at the same time trying to understand its particularities and requisites.

Key words: *design, sound, user experience, interactivity, multimedia*.

Bibliografia consultada

ALTEN, Stanley R., *Audio in Media*, Wadsworth Thomson Learning, Boston, 2002

BARRASS, Stephen, *Auditory Information Design*, Ph.D. Thesis, Australian National University, Canberra, 31/07/1997. Acedido em 10 de Abril de 2010 em http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.127.6228&rep=rep1&type=pdf.

BUXTON, Bill, *Sketching User Experiences: getting the design right and the right design*, Morgan Kaufmann, Canadá, 2007.

CHION, Michel, *Audio-Vision. Sound on Screen*, Columbia University Press, Columbia, 1994.

CANCELLARO, Joseph, *Exploring Sound Design for Interactive Media*, Thomson Delmar Learning, Canada, 2005.

COOPER, Alan, REIMANN, Rober, & CRONIN, David, *About Face – The Essentials of Interaction Design*, Wiley, Indianapolis, 2007.

FLUSSER, Vilém, *Uma filosofia do design. A forma das coisas*, Relógio D'Água, Lisboa, 2010.

GIBBS, Tony, *The Fundamentals of Sonic Art & Sound Design*, AVA Academia, Singapura, 2007

HOWARD, James M., & ANGUS, James A. S., *Acoustics and Psychoacoustics*, Focal Press, Oxford, 1996. (tenho dúvida se a bibliografia deste livro está feita de forma correcta).

JENSENIUS, Alexander Refsum, *Action – Sound. Developing Methods and Tools to Study Music-Related Body Movement*, Ph.D. Thesis, Department of Musicology of the University of Oslo, Oslo, 11/07/2007. Acedido em 16 de Maio de 2010 em http://folk.uio.no/alexanje/phd/jensenius-phd.pdf.

KORTUM, Philip, *HCI Beyond the GUI: Design for haptic, speech, olfactory and other non-traditional interfaces*, Morgan Kaufmann, Burlington, 2008.

LINDERMAN, Matthew, & FRIED, Jason, *Defensive Design for the Web. How to improve error messages, help, forms, and other crisis points*. New Riders, Berkley, 2004.

WEINSCHENK, Susan M., *Neuro Web Design. What makes them click?*, New Riders, Berkeley, 2009.

NORMAN, Donald A., *The Design of Everyday Things*, The MIT Press, London, 2000.

PIRHONEN, Antti, & BREWSTER, Stephen, *Haptic and Audio Interaction Design.* Berlin, Springer, 2008.

PREECE, Jenny, & et al, *Human-Computer Interacton*, Addison-Wesley, Great Britain, 1994.

RÖBER, Niklas, *Interaction with Sound*, Ph.D. Thesis, vorgelegt der Fakultät für Informatik der Otto-von-Guericke Universität Magdeburg, 16/09/2008. Acedido em 10 de Junho de 2010 em http://www.x3t.net/documents/phd/Dissertation.pdf.

UNGER, Russ, & CHANDLER, Carolyn, *A Project Guide to UX Design: For user experience designers in the field or in the making*. Peachpit Press, Berkley, 2009.

Páginas de internet consultadas

10 Tips for Effective Web Sound Design http://www.everydaylistening.com/articles/2009/6/21/10-tips-for-effective-web-sound-design.html, Acedido em 3 de Setembro de 2010.

AMANDUSSON , Sarah, *Auditory Display and the VTK Sonification Toolkit*, http://www.nada.kth.se/utbildning/grukth/exjobb/rapportlistor/2003/rapporter03/amandusson_sarah_03144.pdf, Acedido em 10 de Setembro de 2010.

BARNOSKI, Karel, *Product Sonification*, http://www.uxmag.com/design/product-sonification, Acedido em 5 de Fevereiro de 2011.

BARRASS, Stephen, *Sonification Design Patterns*, http://www.icad.org/websiteV2.0/Conferences/ICAD2003/paper/42%20Barrass.pdf, Acedido em 10 de Abril de 2010.

BARRASS, Stephen, *TaDa! Demonstrations of Auditory Information Design*, http://www.icad.org/websiteV2.0/Conferences/ICAD96/proc96/barrass.htm, Acedido em 10 de Abril de 2010.

BARRASS, Stephen, *Developing the Practice and Theory of Stream-based Sonification*, http://scan.net.au/scan/journal/display.php?journal_id=135, Acedido em 10 de Abril de 2010.

BREWSTER, Stephen, RATY, Veli-Pekka, & KORTEKANGAS, Atte, *Earcons as a Method of Providing Navigational Cues in a Menu Hierarchy*, http://www.dcs.gla.ac.uk/~stephen/papers/HCI96_MenuHierarchy.PDF, Acedido em 10 de Abril de 2010.

Goddard Space Flight Center, *Documentation xSonify*, http://spdf.gsfc.nasa.gov/research/sonification/documents/Alltogether.pdf, Acedido em 6 de Março de 2010.

LEITE, Jair Cavalcanti, & SOUZA, Clarisse Sieckenius de, *Uma Linguagem de Especificação para a Engenharia Semiótica de Interfaces de Usuário*, http://www.unicamp.br/~ihc99/Ihc99/AtasIHC99/art23.pdf, Acedido em 15 de Outubro de 2010.

LUCAS, Paul, *An Evaluation of the Communicative Ability of Auditory Icons and Earcons*, http://dev.icad.org/Proceedings/1994/Lucas1994.pdf, Acedido em 15 de Outubro de 2010.

MCGEE, Ryan, *Auditory Displays and Sonification*, http://www.lifeorange.com/writing/Sonification_Auditory_Display.pdf, Acedido em 17 de Outubro de 2010.

NIELSEN, Jakob, *Ten Usability Heuristics*, http://www.useit.com/papers/heuristic/heuristic_list.html, Acedido em 8 de Julho de 2010.

NORMAN, Donald, *Affordances and Design*, http://www.jnd.org/dn.mss/affordances_and_design.html, Acedido em 8 de Julho de 2010.

REIMER, Jeremy, *A History of the GUI*, http://arstechnica.com/old/content/2005/05/gui.ars, Acedido em 7 de Julho de 2010.

ROCCHESSO, Davide, et al, *Sonic Interaction Design: Sound, Information and Experience*, http://www.speech.kth.se/prod/publications/files/3182.pdf, Acedido em 10 de Outubro de 2010.

RUTLEDGE, Andy, *Creativity is Not Design*, http://www.andyrutledge.com/creativity-is-not-design-test-2.php, Acedido em 9 de Fevereiro de 2010.

SHNEIDERMAN, Ben, *Shneiderman's "Eight Golden Rules of Interface Design"*, http://faculty.washington.edu/jtenenbg/courses/360/f04/sessions/schneidermanGoldenRules.html, Acedido em 8 de Julho de 2010.

SOEGAARD, Mads, *Affordances*, http://www.interaction-design.org/encyclopedia/affordances.html, Acedido em 10 de Julho de 2010.

TOGNAZZINI, Bruce, *First Principles of Interaction Design*, http://www.asktog.com/basics/firstPrinciples.html, Acedido em 10 de Julho de 2010.

WOZNIEWSKI, Mike, et al, *AudioScape*, http://artengine.ca/~catalogue-pd/33-Wozniewski.pdf, Acedido em 14 de Março de 2010.

- Anexo I –

Páginas de internet com informação e exemplos das questões abordadas nesta dissertação

AudioUserInterface.org
http://audiouserinterface.org/

Australian Sound Design Project (ASDP)
http://www.sounddesign.unimelb.edu.au/site/index1.html

Binaural Media
http://www.binauralmedia.org/news/pt

Boxes and Arrows
http://boxesandarrows.com/

Developing the Practice and Theory of Stream-based Sonification
http://scan.net.au/scan/journal/display.php?journal_id=135

Don Norman's jnd website
http://www.jnd.org/

Ear Studio
http://earstudio.com/

Everyday Listening – Sonic Inspiration
http://www.everydaylistening.com

Exemplos de sonificação
http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/media/Sound1_Background.mp3

http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/media/Sound2_AbsenceUnfiltered.mp3

http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/media/Sound3_AbsenceFiltThr.mp3

http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/media/Sound4_Sleep3Filtered.mp3

http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/media/Sound5_Sleep2Filtered.mp3

Interaction-Design.Org
http://www.interaction-design.org/

Interaction Design Association
http://www.ixda.org/

Interactions Magazine
http://interactions.acm.org/

International Community for Auditory Display
http://www.icad.org/

Janek schafer
http://www.audioh.com/directory.html

Knut aufermann
http://knut.klingt.org/

Mobile Sound, Sound, Mobile Media, Art & Culture
http://mobilesound.wordpress.com/

Scanner
http://www.scannerdot.com/scanner.shtml

Sound is Art
http://margaretnoble.net/blog/

Stephen Barrass
http://stephenbarrass.wordpress.com/

The Sound Agency
http://www.thesoundagency.com/home.asp

Thomas Hermann's research on Sonification, Data Mining and Ambient Intelligence
http://sonification.de/

Thomas Hermann's research on Sonification, Data Mining and Ambient Intelligence - Sonification of Complex Biomedical Data
http://www.techfak.uni-bielefeld.de/ags/ami/datason/demo/JBiolPhys2008/index.html

Usability Professionals' Association
http://www.usabilityprofessionals.org/

useit.com: Jakob Nielsen's Website
http://www.useit.com/

User Experience Network
http://uxnet.org/

Ux Booth User Experience & Usability Blog
http://www.uxbooth.com/

UX Magazine
http://www.uxmag.com/

Ux Matters – Insights and inspiration for the user experience community
http://www.uxmatters.com/

{Sound + Design}
http://www.soundplusdesign.com/