Protótipo de Jogo Digital para Pessoas com Deficiência Motora Usando OpenCV

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Abstract. *This article has the main goal of exemplify the use of digital games on motor recuperation of disabled people . Through of OpenCL is possible to build new iterations between users and digital games , without to the use of joysticks or keyboards, making the main focus of the digital game the recuperation of mobility of patient with entertainment*

Resumo. *Este artigo tem o objetivo principal de exemplificar a utilização dos jogos digitais na recuperação motora de pessoas com deficiência. Através de OpenCL é possível construir novas iterações entre usuários e jogos digitais, sem o uso de joysticks ou teclados, tornando o foco principal do jogo digital, a recuperação da mobilidade do paciente com entretenimento*

1. Introdução

Jogos digitais tem sido utilizados normalmente como forma de entretenimento e o seu consume tem crescido ano após ano, tornando possível o desenvolvimento de novas formas de interação entre usuários e jogos digitais.[] Grandes empresas tem desenvolvidos dispositivos para interação dos jogadores com os jogos digitais tais como: Kinect da Microsoft e o Leap Motion[fjdklfds]

Essas ferramentas tem proporcionado uma interação gestual entre usuários e máquinas, substituindo em alguns casos, completamente periféricos mais tradicionais como teclado, mouse e joysticks. Esses periféricos necessitam que o usuário tenha uma boa coordenação motora para plena utilização, o que reduz ou até mesmo exclui pessoas com deficiência motora.

Com o uso da biblioteca OpenCV é possível construir aplicações que possuam interação gestual com o usuário usando dispositivos simples como câmeras de vídeo com a vantagem de estar disponível para um grande numero sistemas operacionais desktops como, Windows, Linux, Android, MacOS, FreeBSD, OpenBSD e mobile como Android, Maemo e iOS, além de poder ser usada em diversas linguagens de programação tais quais C, Python e Java.[]

Atualmente grande partes dos dispositivos possui uma câmera digital com capacidade suficiente para capturar movimentos e possibilitar ao usuário uma interação sem contato direto com a tela, ou teclado do dispositivo. Devido a disponibilidade dos dispositivos móveis é possível disponibilizar esse recurso na recuperação motora de pessoas com necessidade de readquirir a mobilidade perdida.

2. First Page

The first page must display the paper title, the name and address of the authors, the abstract in English and "resumo" in Portuguese ("resumos" are required only for papers written in Portuguese). The title must be centered over the whole page, in 16 point boldface font and with 12 points of space before itself. Author names must be centered in 12 point font, bold, all of them disposed in the same line, separated by commas and with 12 points of space after the title. Addresses must be centered in 12 point font, also with 12 points of space after the authors' names. E-mail addresses should be written using font Courier New, 10 point nominal size, with 6 points of space before and 6 points of space after.

The abstract and "resumo" (if is the case) must be in 12 point Times font, indented 0.8cm on both sides. The word **Abstract** and **Resumo**, should be written in boldface and must precede the text.

3. CD-ROMs and Printed Proceedings

In some conferences, the papers are published on CD-ROM while only the abstract is published in the printed Proceedings. In this case, authors are invited to prepare two final versions of the paper. One, complete, to be published on the CD and the other, containing only the first page, with abstract and "resumo" (for papers in Portuguese).

4. Sections and Paragraphs

Section titles must be in boldface, 13pt, flush left. There should be an extra 12 pt of space before each title. Section numbering is optional. The first paragraph of each section should not be indented, while the first lines of subsequent paragraphs should be indented by 1.27 cm.

4.1. Subsections

The subsection titles must be in boldface, 12pt, flush left.

5. Figures and Captions

Figure and table captions should be centered if less than one line (Figure 1), otherwise justified and indented by 0.8cm on both margins, as shown in Figure 2. The caption font must be Helvetica, 10 point, boldface, with 6 points of space before and after each caption.

In tables, try to avoid the use of colored or shaded backgrounds, and avoid thick, doubled, or unnecessary framing lines. When reporting empirical data, do not use more decimal digits than warranted by their precision and reproducibility. Table caption must be placed before the table (see Table 1) and the font used must also be Helvetica, 10 point, boldface, with 6 points of space before and after each caption.

6. Images

All images and illustrations should be in black-and-white, or gray tones, excepting for the papers that will be electronically available (on CD-ROMs, internet, etc.). The image resolution on paper should be about 600 dpi for black-and-white images, and 150-300 dpi for grayscale images. Do not include images with excessive resolution, as they may take hours to print, without any visible difference in the result.

Figure 1. A typical figure

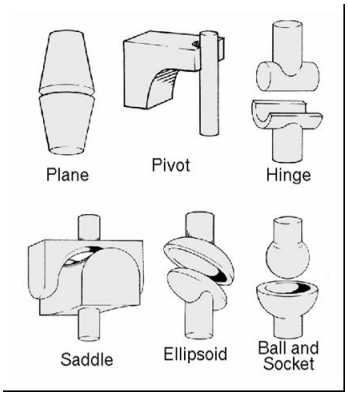

Figure 2. This figure is an example of a figure caption taking more than one line and justified considering margins mentioned in Section 5.

7. References

Bibliographic references must be unambiguous and uniform. We recommend giving the author names references in brackets, e.g. [Knuth 1984], [Boulic and Renault 1991], and [Smith and Jones 1999].

The references must be listed using 12 point font size, with 6 points of space before each reference. The first line of each reference should not be indented, while the subsequent should be indented by 0.5 cm.

References

Boulic, R. and Renault, O. (1991). 3d hierarchies for animation. In Magnenat-Thalmann, N. and Thalmann, D., editors, *New Trends in Animation and Visualization*. John Wiley & Sons ltd.

Knuth, D. E. (1984). *The TEX Book*. Addison-Wesley, 15th edition.

Smith, A. and Jones, B. (1999). On the complexity of computing. In Smith-Jones, A. B., editor, *Advances in Computer Science*, pages 555–566. Publishing Press.

Table 1. Variables to be considered on the evaluation of interaction techniques

	Chessboard top view	Chessboard perspective view
Selection with side movements	6.02 ± 5.22	7.01±6.84
Selection with in-depth movements	6.29±4.99	12.22±11.33
Manipulation with side movements	4.66± 4.94	3.47±2.20
Manipulation with in-depth movements	5.71 ±4.55	5.37 ±3.28