A Gait Analysis Software as a Service

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***Abstract*—This paper describes the first implementation version of a human gait analysis Software as a Service (SaaS). This approach has as advantage, the software availability at web. After the software is implanted at a web server, users can access him from a recent web browser with support to HTML5. The software objective is to minimize the code development necessities by gait analysis researchers, as well as be a useful tool for health professionals interested in human gait analysis. The software allows import positionals data from a third party motion captures system, that uses surface markers and video cameras, to plot markers spatial progression, angles, angular velocities and angular accelerations. Furthermore, it is possible to see and to interact with a 3D animation from markers. The software source code is available as free software, often receive new features and a new community is being created to maintain him.**

***Index Terms*—Gait analysis, software as a service, SaaS.**

I. Introduction

WITH the software web advent now is possible to create services, put them at central web servers and use them from any part of world. Furthermore, modern web browsers have become a truly platform, allowing rich interfaces creation, including graphics presentation and 3D animations, without the necessity of plugins installations. These two technologies, web browsers and web servers, can be used to build what is known as Software as a Service (SaaS). The SaaS advantages for customers and software developers are [1]: customers do not need to install the application; data associated with the service is kept centralized, so it is more protected; data can be collectively accessed by a group of users; big datasets and data that is frequently updated, are kept centralized and remote access to them are offered; only a single copy of the server software runs in a controlled hardware and operating system environment, which avoids compatibility problems, in addition, new versions of the software can be tested with a small fraction of the real customers without disturbing most customers.

Although there was gait analysis advancements by the middle of century XX, clinic gait analysis became broadly available only with the modern computer advent [2]. Actually there are a lot of software packages for this finality [3], but until now at century XXI, no software provider committed to deliver a gait analysis SaaS, in other words, health professionals or gait analysis researchers who want use software, have to use software installed at specifics hardware and operating systems, they have to be responsible by data backup, if new features are incorporated to new software versions, the software must be installed again, if they want share data, they must copy and send them to the destiny and others security concerns must be addressed too. All these problems can be minimized or until eliminated with a SaaS.

To build a software it is necessary collect requisites, and a certain domain of the field must be addressed, at this case gait analysis. Thankfully, nowadays, the theme is quite documented [4], [5], [6], [7], [8], [9], [3], [9], [10], [11]. Moreover, there are health professionals at the development team with much experience in gait analysis. With all this in mind, this paper describes the first implementation version of a gait analysis SaaS [12]. This software version can import data from a third party motion capture system, at this case data collected from video cameras using surface markers, the software also can name markers, define angles, using data from the markers, and plot markers progression at space, angles, angular velocities and angular accelerations. Moreover, the software presents a 3D animation from data and allows user interact with the animation.

II. Materials and Methods

Two researches environments were used to undertake the project. One was the Laboratrio de Performance Humana (LPH) at Faculdade Ceilandia (FCE) / Universidade de Brasilia (UnB), and the other was the Laboratrio de Informatica em Saude (LIS) at Faculdade Gama (FGA) / UnB. At LPH data was collected and at LIS these software version was developed.

The next subsections presents the process for data acquisition, the development process and the software architecture general view.

A. Data Acquisition

III. Conclusion

The conclusion goes here.

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