Live Demonstration: 3D Wound Detection & Tracking System Based on Artificial Intelligence Algorithm

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***Abstract*— Every year over 2% of the worldwide population (estimated 20 million people between US and Europe) will develop a cutaneous wound during their lifetime experiencing chronic pain, reduced mobility and a high amputation and mortality risk (75% within 5 years). Aging of the population and a sharp rise in the incidence of obesity and chronic diseases such as diabetes are the main drivers of this epidemic that is forecast to grow with a 5-8% rate over the following 5 years. Clinical studies proved that is possible to reduce healing time and the advent of adverse consequences of 50% carrying out a monitoring of the variation of key parameters. Nowadays physicians don't have access to a precise decision-supporting tool to valuate and monitor healing process and the effectiveness of the delivered treatment. Our solution is called Wound Viewer, a Class 1 medical device able to acquire and automatically process wound images through an artificial intelligence (AI) algorithm providing to the physician fundamental parameters such as area, depth, recognize the tissue composing the wound (example: granular, necrotic) and wound exudate. Wound Viewer has been tested on over 400 patients reaching a measurement accuracy of over 94%.**

I. DEMONSTRATION SETUP

First, we will connect the Wound Viewer device to an external monitor through HDMI cable. After this, we will turn on the Wound Viewer and we will start acquiring pictures of medical manikins characterized by the presence of wounds with different size and color. The Artificial Intelligence algorithm[1,2] integrated in the Wound Viewer will analyze all the parameters and will graphically represent the results on the screen. We will also have a poster to describe our demonstration in further detail.

II. VISITOR EXPERIENCE

Anyone is welcome to participate our demonstration. Through the acquisition of a simple photography, the visitor will be able to experience the ability of the algorithm to automatically recognize the presence of a wound and to analyze the following parameters:

- Wound 2D-3D dimensions (length, depth, area, volume)
- Granulation tissue/color segmentation
- Presence of exudate wound

The visitors will then get an insight of the importance that these parameters play in the determination of wound healing time. At the end, utilizing our Cloud system, each visitor will have the opportunity to share the pictures with a physician that will provide a remote medical consultation.

III. PLATFORM OVERVIEW

Figure 1: Final Wound Viewer hardware (A) and data management platform (B)

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