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THERMOGRAPHY: DIFFERENT PERSPECTIVES AND APPLICATIONS IN ENGINEERING, DENTAL MEDICINE AND FINE ARTS

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ABSTRACT

This work presents the potential of thermography in three different areas: engineering, dental medicine and painting. It is intended to show the extent of use of this tool by highlighting three different universes in which thermography can be used. The first approach shows how the technology is built and its functions, the second describes how it can be applied, and the third explores how it can be interpreted.

Keywords: thermography, engineering, dental medicine, artistic creation, painting.

INTRODUCTION

"Thermography is an imaging technique that allows you to record the distribution of the thermal radiation emitted by the surface of the body, transforming it through the laws of physics into temperature values. This image technique was introduced in medicine in 1956 by Ray Lawson, allowing real-time physiology to be evaluated, namely to monitor skin surface temperature "(Vardasca, Ramalhão, Gabriel, 2016: 7)

Compared to other medical imaging models, also resulting from the recording of the electromagnetic spectrum (e.g., scintigraphy, radiography, magnetic resonance imaging, echography, X-ray, among others), thermography is characterized as not being invasive and not having side effects such as exposure to nuclear radiation. Additionally, the results are almost immediate through recording a simple image that resembles a photograph.

In terms of its diagnosis accuracy, thermography may replace the use of more invasive diagnostic systems, and, for example, it may have very practical applications at the level of pain symptoms, namely, orofacial and musculoskeletal pain. Since pain is usually associated with processes of muscle tension or inflammation, the temperature in these regions is higher, what facilitates the registration of a thermographic image.

In addition to its technological basis and medical applications, the thermographic image can be a stimulus for artistic creation, offering a different view from the reality. Artists, and particularly painters, are strongly influenced by the processes of seeing and perceiving the real and technological innovations has often the potential for new perspectives, and new interpretations of the visible world. The same has happened with the discovery of photography, an essential tool for Impressionist painting, or with the cinema that stimulated the Futurism and Cubism movements', or the impact of the virtual image at the present time. The thermography allows the reading of the real world through a transformation imposed by

the present moment, namely, through the measure of heat, the light, as the reflective qualities of the objects. Thus, at each spatiotemporal moment the record of the objects is distinct, and each image shows a new transformation.

This work aims, not only to present the potential of thermography as a tool with several applications, including dental medicine, but also to show how it can contribute for artistic creation, through the transformation of the real world image.

RESULTS AND CONCLUSIONS

The conclusions of this work are the following:

Thermographic image is a useful tool as compared to other types of medical diagnostic imaging applied, specifically, in biomechanical areas and sports.

The practical applications of thermography in the diagnosis of orofacial pain are demonstrated, supporting its feasibility as a tool to assess the efficacy of prescribed treatments, and to monitor the elimination of the factors that gave rise to pain symptoms.

Finally, thermographic image provides a different reading of the real world, giving rise to images that the human eye does not detect, but which the imagination can construct and, eventually, apply it to artistic creation. Art absorbs new perspectives of reality; and art itself is transformed by the continuous discovery of new tools that allow the construction of new perspectives of reality.

This work shows how thermography is useful as a medical diagnostic tool, how it is applied in the diagnosis and validation of dental treatment, and finally, how the resulting image allows a distinctive and stimulating perspective for artists.

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