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Orthopaedic use of 3D Printing Applied to the Flat Foot Diseases

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A general view of the technique most used in the medical field is provided for the diagnosis and treatment of congenital flat foot from tarsal synostosis. An alternative methodology is proposed which involves the inclusion of a new technology within the traditional method workflow. In orthopedics new technologies such as 3D printing are introduced with the aim of improving patient diagnosis by supporting healthcare personnel. These technologies allow treatments to be performed more quickly and accurately. In fact, surgical planning has undergone an evolutionary process that has seen it progress hand in hand with the improvement of technologies available for diagnostic imaging. In the early 1900s, the only diagnostic imaging technique used was radiology. Today, however, this is flanked by more modern acquisition systems such as CT computed tomography, which provide the surgeon with detailed reconstructions of the patient's anatomy. The proposed methodology wants to take a further step forward, transferring the planning phase from the virtual world to the physical one through the printing of three-dimensional reconstructions of the anatomical parts. The workflow to get to the printing of anatomical models starts from tomographic images acquired through the traditional non-invasive acquisition technique, the TC, to then use a series of software to convert the images into a three-dimensional digital file format, readable by CAD and then from a 3D printing software. At the end of the work, the impact of this innovative procedure both from an economic and a functional point of view was evaluated.

Biography:

Leonardo Frizziero graduated in Mechanical Engineering at University of Bologna in 2003. In academic field, he promotes the scientific issues related to Design Methods (CAD, QFD, TRIZ, DFSS, 3D Printing, AR, etc). In 2005, he was recruited by Ferrari Spa as project manager of new cars projects. In 2009 he obtained the Ph.D. degree and then he became Junior Assistant Professor in February 2013 at AMS University of Bologna. He teaches and follows researches in several design fields, including bio-engineering applications, such as 3D Printing and Augmented Reality applied to human bones. Since 2017 he is qualified Associate Professor. Since 2018, he has been a Senior Assistant Professor.