3D Printing in Medicine
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Abstract:
Introduction: The practice of modern medicine in many medical subspecialties relies on advanced imaging. Computerized Tomography and Magnetic Resonance Imaging can produce 3D images aiming to provide physicians with improved appreciation of the anatomy. Three dimensional printing technology called “3D printing”, VR technology (virtual Reality) of cardiovascular structures is an emerging new tool poised to enhance appreciation of complex cardiac anatomic features and their interrelationships with surrounding tissues, and also to play an important role in preoperative planning and surgical simulation.

Objectives: We seek to explore the utility of creating anatomically accurate 3D printing models for patients with complex or unusual congenital heart defects in facilitating diagnostic understanding, family counseling, interventional or surgical planning, as well as team teaching and simulation.

Methods: Based on contrast-enhanced computer tomography (CT) or magnetic resonance (MRI) images, after appropriate segmentation and processing, accurate 3D printed models of the relevant cardiac anatomy (including appropriately planned sections based on individualized case assessment) are created. These are then utilized for the entire cardiology - surgical team to appreciate the anatomy, for patient family education, and for optimizing surgical planning, including surgical or interventional teaching and simulation.

Biography:
Chief of Clinical Applications. Graduated as an Electronic and Electrical Engineer from UWS in Scotland and received a Master Degree with Commendation on Data Communications from Birmingham City University in England. The last 12 Years works as a Stratasys Engineer based on 3D printing world, and has been excelled in the sector of 3D Printing design worldwide. Leonardo Bilalis has been working at EMEA under Stratasys umbrella and has been responsible for informing and training more than 150 companies and universities. He has participated in more than 100 seminars for 3D printing in US and Germany. One of the greatest successes and innovations is the world’s first three-dimensional printed air turbine, with applications in unmanned aerial vehicle (UAV), in collaboration with Stratasys-Dassault and first introduced in Abu Dhabi AIR SHOW in 2015.

Recent Publications:
2. Evolutionary Computing and Genetic Algorithms: Paradigm Applications in 3D Printing Process Optimization

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