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Bio-mechanics in virtual and mixed reality for computer assisted surgery

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The recent and continuous advance of visualization techniques in the computer vision era has brought many benefits to healthcare. They are seen either as potential disruptive technologies in the surgical workplace or breakthroughs for medical education and assistance. Mixed Reality (MR) and Virtual Reality (VR) are among those worldwide topics becoming democratized: High quality and impressively affordable. Their application into healthcare to improve the medical use of data is certain. Their potential usage may concern anatomy, intraoperative surgery, or post-operative rehabilitation. The need for realistic haptic and display gives additional interest to the biomechanical modeling of living tissues. The integration of MR/AR with numerical modelings, such as the finite element method, provides an objective and automated way for practitioners to analyze healthcare problems and find efficient solutions. This presentation aims to provide an overview of state-of-the-art and recent advances in the usage of biomechanics in MR/AR for computer assisted surgery.

Biography

Abed Malti received the MS degree in control systems and signal processing from the National Polytechnic Institute of Lorraine (Nancy, France) in 2002. He did his PhD thesis in the robotic team of LAAS-CNRS (Toulouse, France), where he worked in sensor landmark motion planning for mobile robots. He received his PhD degree in 2005 from the University of Paul Sabatier (Toulouse, France). From 2006 to 2008, he followed up with MS degree studies in basic mathematics. From 2008 to 2015, he worked as Research Fellow in computer vision applied to medical assisted surgery. Since 2015, he is an Associate Professor at the University of Tlemcen, Algeria. The Algerian Ministry of Research is funding his project on the design of a surgical simulator based on virtual reality. He is also CSO and Head of Technology at octi stratup in Los Angeles, California, USA. The startup aims at developing augmented reality techniques for mobile platform.

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