What is the Future of Minimally Invasive Sinus Surgery: Computer-Assisted Navigation, 3D-Surgical Planner, Augmented Reality in the Operating Room with 'in the Air' Surgeon's Commands as "Biomechanics" of the New Era in Personalized Contactless Hand-Gesture Non-Invasive Surgeon-Computer Interaction?

Klapan Ivica[1,2,3,4]*, Duspara Alen[6], Majhen Zlatko[5,7], Benić Igor[8], Kostelac Milan[8], Kubat Goranka[9], Berlengi Nedjeljka[10], Zemba Mladen[10], Žagar Martin[11]

[1]*Division of ENT-Head and Neck Surgery, Klapan Medical Group Polyclinic, Zagreb, Croatia, EU*

[2]*Josip Juraj Strossmayer University of Osijek, School of Medicine, Osijek, Croatia, EU*

[3]*University of Zagreb, School of Medicine, Zagreb, Croatia, EU*

[4]*Josip Juraj Strossmayer University of Osijek, School of Dental Medicine and Health, Croatia, EU*

[5]*Bitmedix, Zagreb, Croatia, EU*

[6]*Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia, EU*

[7]*Avanza, Zagreb, Croatia, EU*

[8]*Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia, EU*

[9]*Division of Radiology, Agram Special Hospital, Zagreb, Croatia, EU*

[10]*Division of Anesthesiology, Klapan Medical Group Polyclinic, Zagreb, Croatia, EU*

[11]*Rochester Institute of Technology, RIT Croatia, Zagreb, EU*

*Corresponding author: Ivica Klapan, Klapan Medical Group Polyclinic, Ilica 191A, HR-10000 Zagreb, Croatia, EU

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ABSTRACT

Purpose: We were focused on the development of personal-3D-navigation system and application of augmented reality in the operating room per viam personalized contactless hand-gesture non-invasive surgeon-computer interaction, with higher intraoperative safety, reduction of operating time, as well as the length of patient postoperative recovery.

Methods: Simultaneous use of video image, 3D anatomic fields and navigation in space, with the application of our original special plug-in application for OsiriX platform, enabling users to use LM-sensor as an interface for camera positioning in 3DVR and VE views, and integrating speech recognition as a VC solution, in an original way.

Results: Management of image 2D-3D-video-medical documentation, as well as the control of marker-based virtual reality simulation in real time during real operation with per viam our personalized contactless "in the air" surgeon's commands.

Conclusion: The use of modern technologies in head and neck surgery in the last 30 years (e.g., FESS, NESS, and robotic surgery) has enabled surgeons to demonstrate spatial anatomic elements in the operating field, which was quite inconceivable before. This