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Digital and intelligent liver surgery in the new era ...

https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964(19)30089-1/fulltext

From the three-dimensional reconstruction of traditional two-dimensional CT images, virtual simulation **surgery** and three-dimensional physical printing to virtual reality technology **and real-time navigation** of fluorescent images, all of these are the innovative development of modern digital medical imaging technology, which have changed the common use of palpation and vision in liver **surgery** to ...

Cited by: 9 **Author:** Chihua Fang, Peng Zhang, Xiaolong Qi
Publish Year: 2019

Consensus recommendations of three-dimensional ...

https://link.springer.com/article/10.1007/s12072-020-10052-y

Jul 07, 2020 · Three-dimensional (3D) **visualization** involves feature extraction and 3D reconstruction of CT images using a computer processing technology. It is a tool for displaying, describing, and interpreting 3D anatomy and morphological features of organs, thus providing intuitive, stereoscopic, and accurate methods for clinical decision-making. It has played an increasingly significant role in the ...

Author: Chihua Fang, Jihyun An, Antonio Brun... **Publish Year:** 2020

Augmented reality navigation system for endoscopic surgery ...

https://www.researchgate.net/publication/248213767...

The **current** state of medical augmented reality is characterized by using three-dimensional approaches in **visualization** [3] and by employing augmented-reality systems in clinical practice [4]. Here ...

Digital and intelligent liver surgery in the new era ...

https://www.sciencedirect.com/science/article/pii/S2352396419300891

Mar 01, 2019 · In 1998, Professor Marescaux [] pointed out that three-dimensional **visualization** of organs helps us to understand the complex anatomy of the liver.The use of virtual reality concept for surgical planning, surgical simulation **as well** as medical training and education will revolutionize the development of liver **surgery** in the 21st century.

Cited by: 9 **Author:** Chihua Fang, Peng Zhang, Xiaolong Qi
Publish Year: 2019

Incorporating New Technologies to Overcome the ...

https://www.sciencedirect.com/science/article/pii/S187887502031456X

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Augmented reality navigation system for endoscopic surgery ...
https://www.researchgate.net/publication/248213767...

Augmented reality **navigation** system for endoscopic **surgery** based on three-dimensional ultrasound **and** computed **tomography:** Application to 20 clinical cases ... to analyze the **current trends** and ...

A real-time navigation system for laparoscopic surgery ...
https://www.researchgate.net/publication/220245645...

Purpose: A near **real-time** three-dimensional (3D) ultrasound **navigation** system has been developed for guiding **surgery** involving internal organs that move and change shape (e.g., abdominal **surgery** ...

Estimated Reading Time: 9 mins

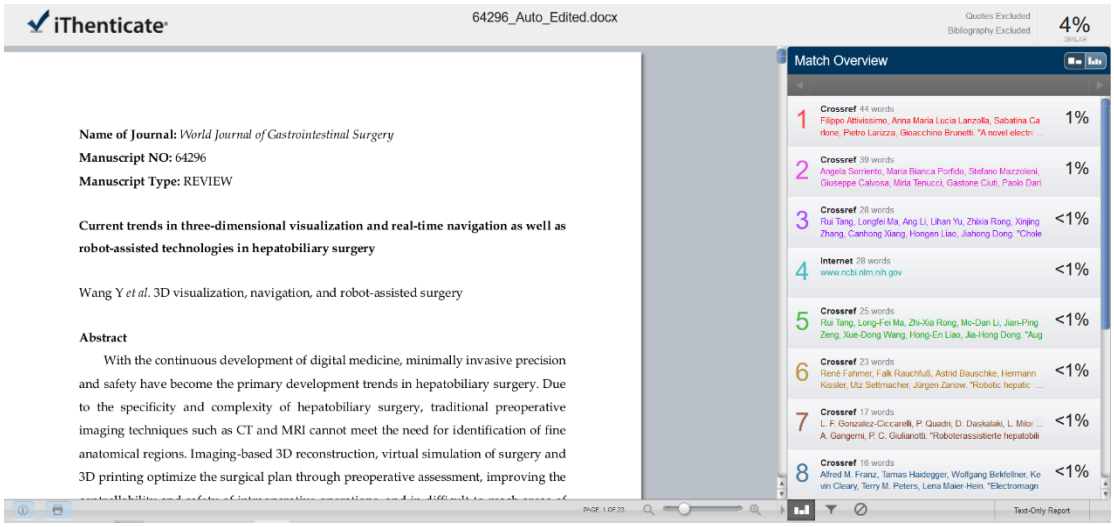
Recent advances in visualization, imaging, and navigation ...
https://www.researchgate.net/publication/26873401...

Augmented reality techniques, **robot assisted** operations and computer assisted **navigation** tools will become increasingly important in **surgery** and in residents' education.

Author: Maki Sugimoto

Handbook of Robotic and Image-Guided Surgery | ScienceDirect
https://www.sciencedirect.com/book/9780128142455

Image-guided **surgery** (IGS) is a general term used for any surgical procedure with indirect vision to realize the MIS. However, in **current** IGS, most three-dimensional (3D) medical images used for surgical **navigation** are displayed in 2D plane monitors, which lack intuitive 3D spatial information.



Name of Journal: *World Journal of Gastrointestinal Surgery*
Manuscript NO: 64296
Manuscript Type: REVIEW

Current trends in three-dimensional visualization and real-time navigation as well as robot-assisted technologies in hepatobiliary surgery

Wang Y *et al*. 3D visualization, navigation, and robot-assisted surgery

Abstract

With the continuous development of digital medicine, minimally invasive precision and safety have become the primary development trends in hepatobiliary surgery. Due to the specificity and complexity of hepatobiliary surgery, traditional preoperative imaging techniques such as CT and MRI cannot meet the need for identification of fine anatomical regions. Imaging-based 3D reconstruction, virtual simulation of surgery and 3D printing optimize the surgical plan through preoperative assessment, improving the

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Augmented reality technology for preoperative planning and ...

https://www.sciencedirect.com/science/article/pii/S149938721830047X

Apr 01, 2018 · Compared with those of conventional **technologies**, AR improves **visualization** for surgical **navigation** and is an important element of precision liver **surgery**. In conventional video-based surgical approaches, such as laparoscopic **surgery**, depth perception tends to be lost when viewing two-dimensional (2D) video images generated by endoscopic ...

Cited by: 52 **Author:** Rui Tang, Long-Fei Ma, Zhi-Xia Rong, Mo ...
Publish Year: 2018

Handbook of Robotic and Image-Guided Surgery | ...

https://www.sciencedirect.com/book/9780128142455

Image-guided **surgery** (IGS) is a general term used for any surgical procedure with indirect vision to realize the MIS. However, in **current** IGS, most three-dimensional (3D) medical images used for surgical **navigation** are displayed in 2D plane monitors, which lack intuitive 3D spatial information.

Three-Dimensional Image-Guided Techniques for Minimally ...

https://www.sciencedirect.com/science/article/pii/B9780128142455000335

Jan 01, 2020 · The main techniques in 3D image-guided systems includes patient–image registration using dedicated tracking tools and spatial tracking of patients , **as well** as rendering accurate 3D images in **real time** and providing an accurate AR interface. 3D image-guided techniques can also be applied in dedicated robotic systems, such as endoscopy and manipulators, to provide a stable operation platform and enhance the capabilities of surgeons to perform accurate **surgery**...

Author: Zhencheng Fan, Longfei Ma, Zhuxiu Li... **Publish Year:** 2020

Recent Development of Augmented Reality in Surgery: A ...

https://www.hindawi.com/journals/jhe/2017/4574172

Introduction . The development augmented reality devices allow physicians to incorporate data **visualization** into diagnostic and treatment procedures to improve work efficiency, safety, and cost and to enhance surgical training. However, the awareness of possibilities of augmented reality is generally low. This review evaluates whether augmented reality can presently improve the results of ...

Cited by: 170 **Author:** Petr Vávra, J. Roman, Pavel Zonča, Peter...
Publish Year: 2017