

HUMAN BEHAVIOUR
RECOGNITION,
IDENTIFICATION,
AND COMPUTER
INTERACTION

Edited by

Othman Omran Khalifa, B.Sc., M.Sc., Ph.D.,
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Chapter 35

Current Trend in Image Guided Surgery (IGS)

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35.1 INTRODUCTION

Image-guided surgery (IGS)/ Computer-aided surgery (CAS) is a technology mostly deployed in minimally invasive operation [1] which involves the use of tracked surgical instruments in real-time, and computer technology to correlate the operative field to pre-operative or intra-operative radiological images during surgical intervention. It also encompasses the use of radiological images and software programs for pre-surgical planning, and post operation monitoring, treatment and medication to patients.

The medical field is one of the few fields of human endeavours where time and equipment precision is of utmost importance because of the need to save life as quickly as possible. More so, within the medical field, relevance of time and equipment precision are even more demanded in the operating theater (OT) especially when it involves critical or emergency situations. However, in these mission critical assignments, the proficiency of the surgeon(s) and the team alone can not guarantee success hence, the need for Image-Guided Surgery (IGS) hardware and software.

Prior to the end of the nineteenth century, medical doctors lacked the ability to definitively diagnosis many internal medical problems without having to cut open the patient [1]. However, things took a new turn with the careful application in 1896 of William Roentgen's 1895 accidental discovery – the X-ray. Hence the name medical imaging emerged, and then one of its most important applications in clinical medicine followed – Image Guided Surgery (IGS).

Medical Imaging is a collective term encompassing all forms of images used for diagnosing, prescribing, and surgical purposes in Medical fields. The images are acquired with the aid of