

# Chapter 1

# Introduction to Digital Imaging

**Aatif Jamshed**

 <https://orcid.org/0000-0003-3152-6147>

*Department of Information Technology, ABES Engineering College, Ghaziabad,  
India*

**Pawan Singh Mehra**

*Delhi Technological University, India*

**Debabrata Samanta**

 <https://orcid.org/0000-0003-4118-2480>

*Rochester Institute of Technology, Kosovo*

**Tanaya Gupta**

*Department of Information Technology, ABES Engineering College, Ghaziabad,  
India*

**Bharat Bhardwaj**

*Department of Information Technology, ABES Engineering College, Ghaziabad,  
India*

## ABSTRACT

*Digital imaging has revolutionized the field of photography and has become an integral part of our daily lives. It involves the use of electronic devices to capture, store, and manipulate images. This research aims to provide an introduction to digital imaging, exploring its history, technology, and applications. The chapter begins by tracing the evolution of digital imaging, from the first digital image created in 1957 to the present day. It delves into the technological advancements that have made digital imaging possible, such as the development of digital cameras, image*

DOI: 10.4018/979-8-3693-5226-7.ch001

*sensors, and image processing software. The chapter also discusses the various components of a digital image, including pixels, resolution, and colour depth, and their significance in producing high-quality images. Furthermore, the chapter explores the applications of digital imaging in various fields such as healthcare, forensics, art, and entertainment. It examines how digital imaging has transformed these industries, making tasks more efficient, accurate, and cost-effective. Moreover, the chapter addresses the challenges and ethical concerns surrounding digital imaging, such as image manipulation and privacy issues. It also discusses the future of digital imaging, including emerging technologies and potential advancements. Overall, this research paper serves as a comprehensive overview of digital imaging, providing readers with a better understanding of its history, technology, and impact on society.*

## **INTRODUCTION**

Digital imaging technology has revolutionized the way we capture, store, and manipulate visual information. Unlike traditional photography, which uses chemical processes to record images on film, digital imaging relies on electronic sensors to capture light and convert it into digital data. This data can then be processed and stored on electronic devices such as computers and smartphones.

Here are some key Concepts in Digital Imaging as shown in Table 1:

### **Pixels**

Pixels are the building blocks of digital images. Each pixel represents a single point of color in an image. The resolution of an image refers to the number of pixels it contains. Higher resolution images have more pixels, which results in sharper and more detailed pictures.

### **Resolution**

Resolution refers to the number of pixels per inch (PPI) or per centimetre (PPC) in an image. It determines the level of detail and clarity in an image. Higher resolution images can display more information and are suitable for tasks requiring fine detail, such as printing high-quality photographs or medical imaging.

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/introduction-to-digital-imaging/361018](http://www.igi-global.com/chapter/introduction-to-digital-imaging/361018)

## Related Content

---

### GUI-CAD Tool for Segmentation and Classification of Abnormalities in Lung CT Image

V. Vijaya Kishore and R.V.S. Satyanarayana (2023). *Research Anthology on Improving Medical Imaging Techniques for Analysis and Intervention* (pp. 686-705). [www.irma-international.org/chapter/gui-cad-tool-for-segmentation-and-classification-of-abnormalities-in-lung-ct-image/315070](http://www.irma-international.org/chapter/gui-cad-tool-for-segmentation-and-classification-of-abnormalities-in-lung-ct-image/315070)

### A Content-Based Approach to Medical Image Retrieval

Anitha K., Naresh K. and Rukmani Devi D. (2023). *Research Anthology on Improving Medical Imaging Techniques for Analysis and Intervention* (pp. 60-78). [www.irma-international.org/chapter/a-content-based-approach-to-medical-image-retrieval/315038](http://www.irma-international.org/chapter/a-content-based-approach-to-medical-image-retrieval/315038)

### Approximation-Aided Epilepsy Detection Using Linear and Non-Linear Classifiers

Usha Govindarajan and Narasimhan K. (2023). *Machine Learning and AI Techniques in Interactive Medical Image Analysis* (pp. 135-150). [www.irma-international.org/chapter/approximation-aided-epilepsy-detection-using-linear-and-non-linear-classifiers/313476](http://www.irma-international.org/chapter/approximation-aided-epilepsy-detection-using-linear-and-non-linear-classifiers/313476)

### A Block-Based Arithmetic Entropy Encoding Scheme for Medical Images

Urvashi Sharma, Meenakshi Sood, Emjee Puthooran and Yugal Kumar (2023). *Research Anthology on Improving Medical Imaging Techniques for Analysis and Intervention* (pp. 190-206). [www.irma-international.org/chapter/a-block-based-arithmetic-entropy-encoding-scheme-for-medical-images/315047](http://www.irma-international.org/chapter/a-block-based-arithmetic-entropy-encoding-scheme-for-medical-images/315047)

### Medical Image Segmentation Techniques: A Review

Anju Shukla, Shishir Kumar, Virendra Singh Kushwah and Amarjeet Singh (2025). *Computer-Assisted Analysis for Digital Medicinal Imagery* (pp. 209-220). [www.irma-international.org/chapter/medical-image-segmentation-techniques/361026](http://www.irma-international.org/chapter/medical-image-segmentation-techniques/361026)