

Image Analysis

Image analysis or **imagery analysis** is the extraction of meaningful information from **images**; mainly from **digital images** by means of **digital image processing** techniques.^[1] Image analysis tasks can be as simple as reading **bar coded** tags or as sophisticated as **identifying a person from their face**.

Computers are indispensable for the analysis of large amounts of data, for tasks that require complex computation, or for the extraction of quantitative information. On the other hand, the human **visual cortex** is an excellent image analysis apparatus, especially for extracting higher-level information, and for many applications — including medicine, security, and remote sensing — human analysts still cannot be replaced by computers. For this reason, many important image analysis tools such as **edge detectors** and **neural networks** are inspired by human **visual perception** models.

Digital Image Analysis or Computer Image Analysis is when a computer or electrical device automatically studies an image to obtain useful information from it. Note that the device is often a computer but may also be an electrical circuit, a digital camera or a mobile phone. It involves the fields of **computer** or **machine vision**, and **medical imaging**, and makes heavy use of **pattern recognition**, **digital geometry**, and **signal processing**. This field of **computer science** developed in the 1950s at academic institutions such as the MIT A.I. Lab, originally as a branch of **artificial intelligence** and **robotics**.

It is the **quantitative** or **qualitative** characterization of **two-dimensional** (2D) or **three-dimensional** (3D) **digital images**. 2D images are, for example, to be analyzed in **computer vision**, and 3D images in **medical imaging**. The field was established in the 1950s—1970s, for example with pioneering contributions by **Azriel Rosenfeld**, **Herbert Freeman**, **Jack E. Bresenham**, or **King-Sun Fu**.

