

A digital image refers to a representation of visual information in a digital format. It is a numeric or binary representation of a two-dimensional or three-dimensional visual scene. Digital images are composed of discrete picture elements called pixels, which are tiny dots that store specific color or grayscale values.

Digital images are created by capturing light or other electromagnetic radiation using a digital sensor, such as a digital camera or scanner. The sensor converts the light into an electrical signal, which is then processed and converted into a digital format that can be stored, manipulated, and displayed on electronic devices.

There are two main types of digital images:

Bitmap/Raster Images: Bitmap or raster images are composed of a grid of pixels, where each pixel represents a specific color or shade of gray. Each pixel is assigned a numerical value that corresponds to its color intensity or brightness level. Bitmap images are resolution-dependent, meaning their quality and level of detail depend on the number of pixels per inch (PPI) or dots per inch (DPI). Common file formats for bitmap images include JPEG, PNG, BMP, and TIFF.

Vector Images: Vector images are created using mathematical formulas that define shapes, lines, and curves. Instead of pixels, vector images consist of geometric objects such as points, lines, and curves, which are defined by their mathematical properties. This makes vector images resolution-independent, as they can be scaled up or down without losing quality. Vector images are commonly used for logos, illustrations, and graphics. File formats like SVG (Scalable Vector Graphics) and AI (Adobe Illustrator) are commonly used for vector images.

Digital images have become an integral part of modern communication, entertainment, and information sharing. They are used in various applications such as photography, graphic design, advertising, web development, medical imaging, scientific visualization, and more. The advancement of digital technology has made it easier to capture, manipulate, store, and transmit digital images, leading to their widespread use in today's digital world.

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