

Digital Image Basics

Pixel and voxel concepts

2D picture elements, 3D volume elements

Bit depth

8-bit (256 levels), 16-bit (65,536 levels)

File formats

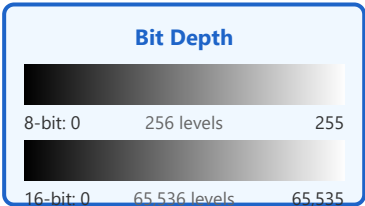
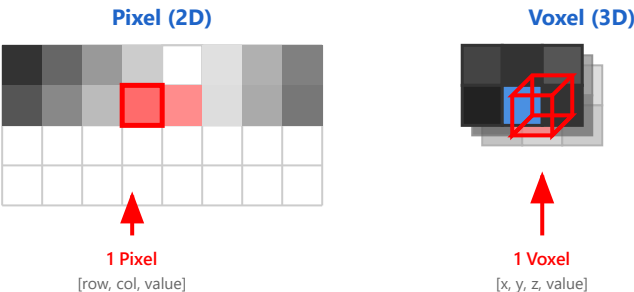
TIFF, PNG (lossless), JPEG (lossy)

Compression methods

Lossless vs lossy tradeoffs

Metadata standards

EXIF, OME-TIFF for scientific imaging



File Format Comparison

Format	Compression	Use Case
TIFF	Lossless	Scientific
PNG	Lossless	Web/Analysis
JPEG	Lossy	Web/Display
DICOM	Both	Medical

