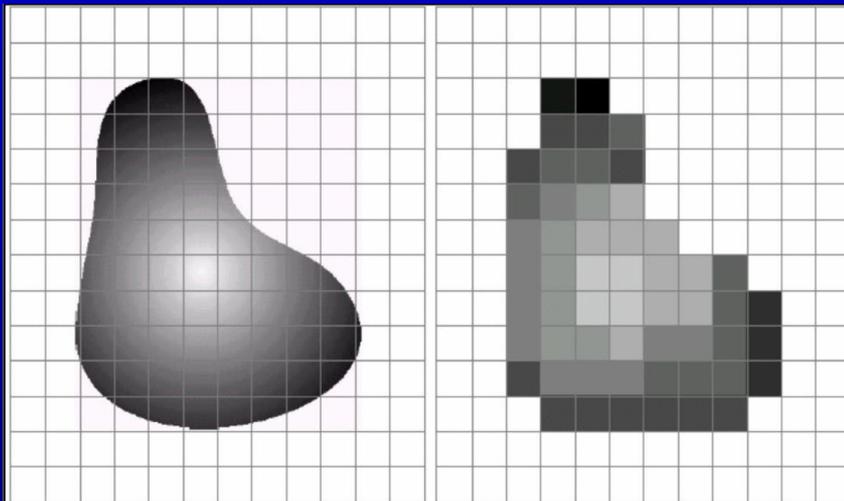


What is an image?

- e.g.: photography
 - Silver photograph: films and papers



a b

FIGURE 2.17 (a) Continuous image projected onto a sensor array. (b) Result of image sampling and quantization.

From continuous to digital domain

What is an image?

- **e.g.: photography**
 - **Silver photograph: films and papers**



55	56	85	108	104
56	57	59	82	100
55	58	59	72	80
56	57	65	77	81
60	60	69	76	78

→ **Digital: Disks, DVD, USB keys...**

**Image = ordered / structured
sequence of numbers**

Image (or spatial) resolution

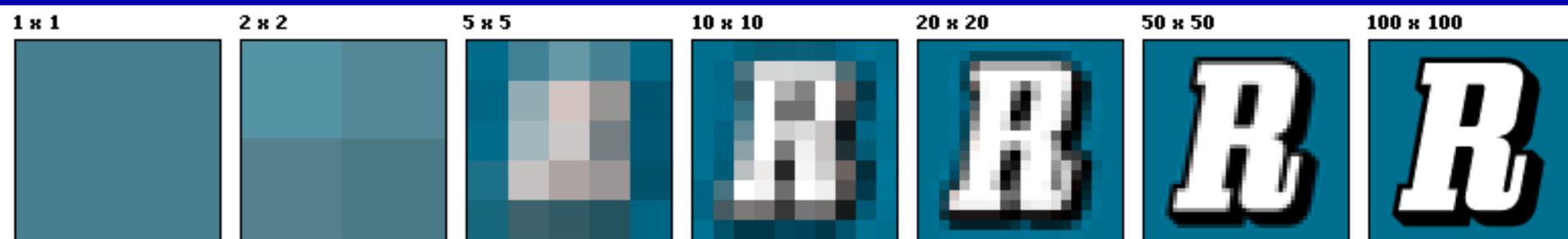
Image resolution relates to the detail an image can hold.

It can quantify how two lines can be to each other and still be visibly resolved

→ quoted by line pairs per millimeter, e.g. 5LP / mm

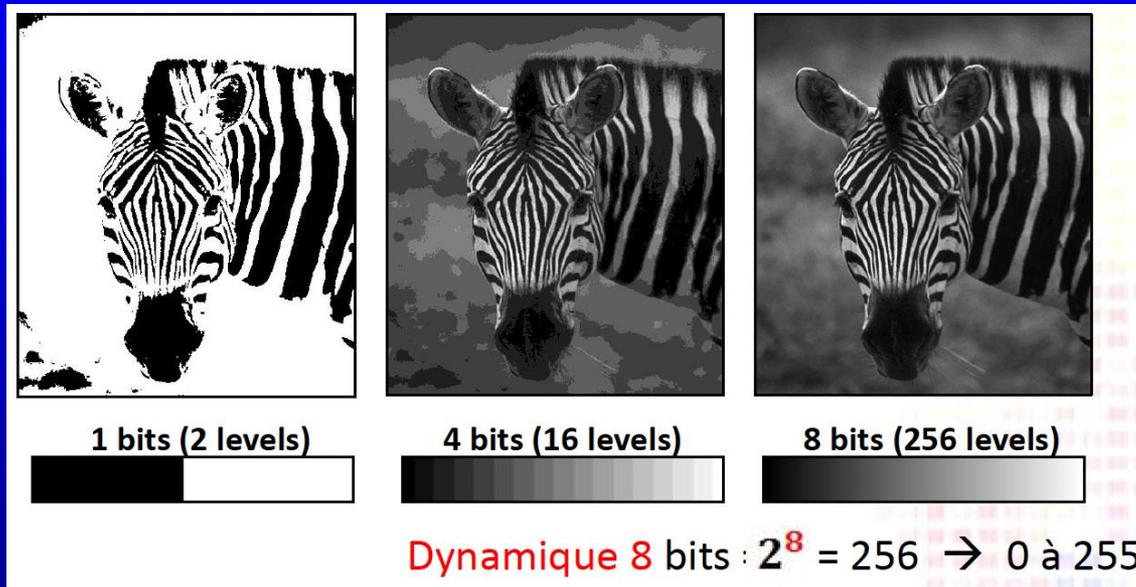
→ or refers to the number of independent pixel values per unit length: ppi.

It is defined by the acquisition system and its point spread function



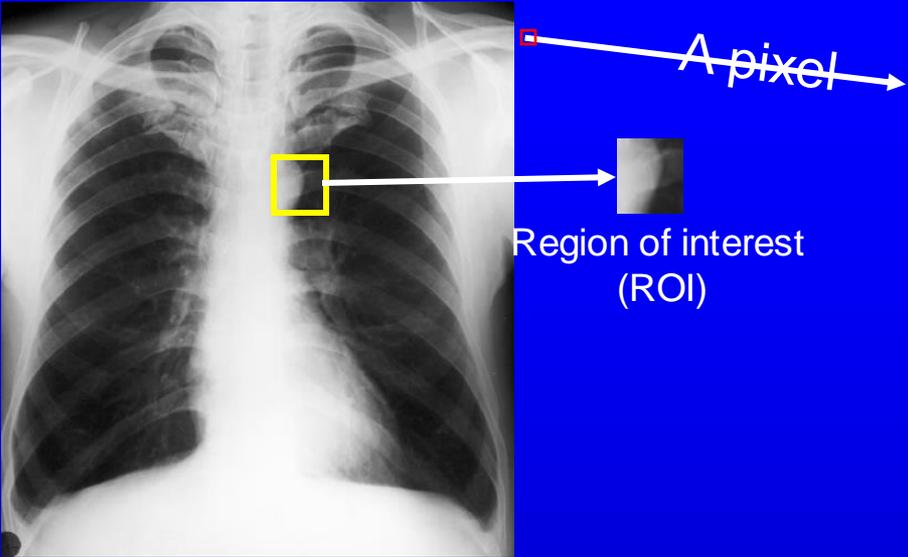
Radiometric resolution

- determines how finely a system can represent or distinguish differences of intensity,
- usually expressed as a number of levels and equivalently a number of bits
 - e.g. 256 levels or 8 bits
 - Human eye can identify ~64 levels of grey



Temporal resolution

- refers to the precision of a measurement with respect to time,
- usually expressed as a number of frames per second
 - e.g. 25 frames / s



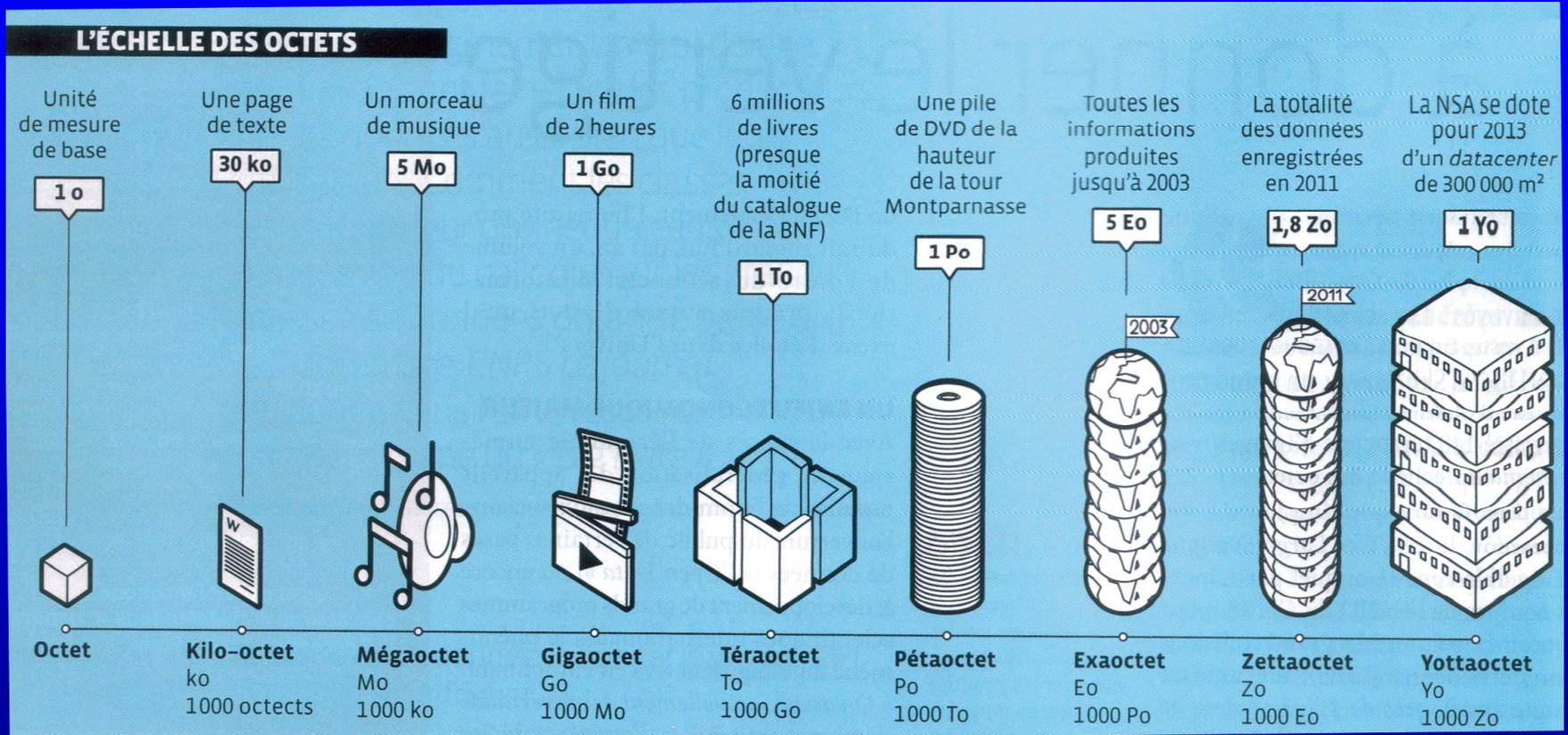
205	204	200	197	196
205	203	199	196	197
204	203	199	196	196
203	202	200	198	198
203	201	197	196	197
201	198	195	193	193
199	197	194	193	192
199	197	193	195	194
198	198	196	195	194
198	198	196	193	192
203	200	198	196	195
205	203	202	199	197

...

⋮

- Image 2D 37 x 38 pixels, 8bits
- Resolution, field of view
- Area=1406 , Mean=121.69, min=30, max=214

The byte scale



CNRS Journal, 2012

Image formats (some)

- Raster Image formats (on a matrix form)

Extension	Name	Compression
TIFF	Tagged Image File	Lossless
PNG	Portable Network Graphics	Lossless
JPEG (or JPG)	Joint Photographic Experts Group	Lossy
GIF	Graphics Interchange Format	Lossless
RAW	Raw Image Formats	Uncompressed

- Vector image formats (geometric description which can be rendered smoothly at any desired display size)
 - SVG: Scalable Vector Graphics
 - PDF: Portable Document Format (compound)
 - EPS: Encapsulated Postscript (compound)
- Movies
 - AVI, QuickTime, mpeg, gif...