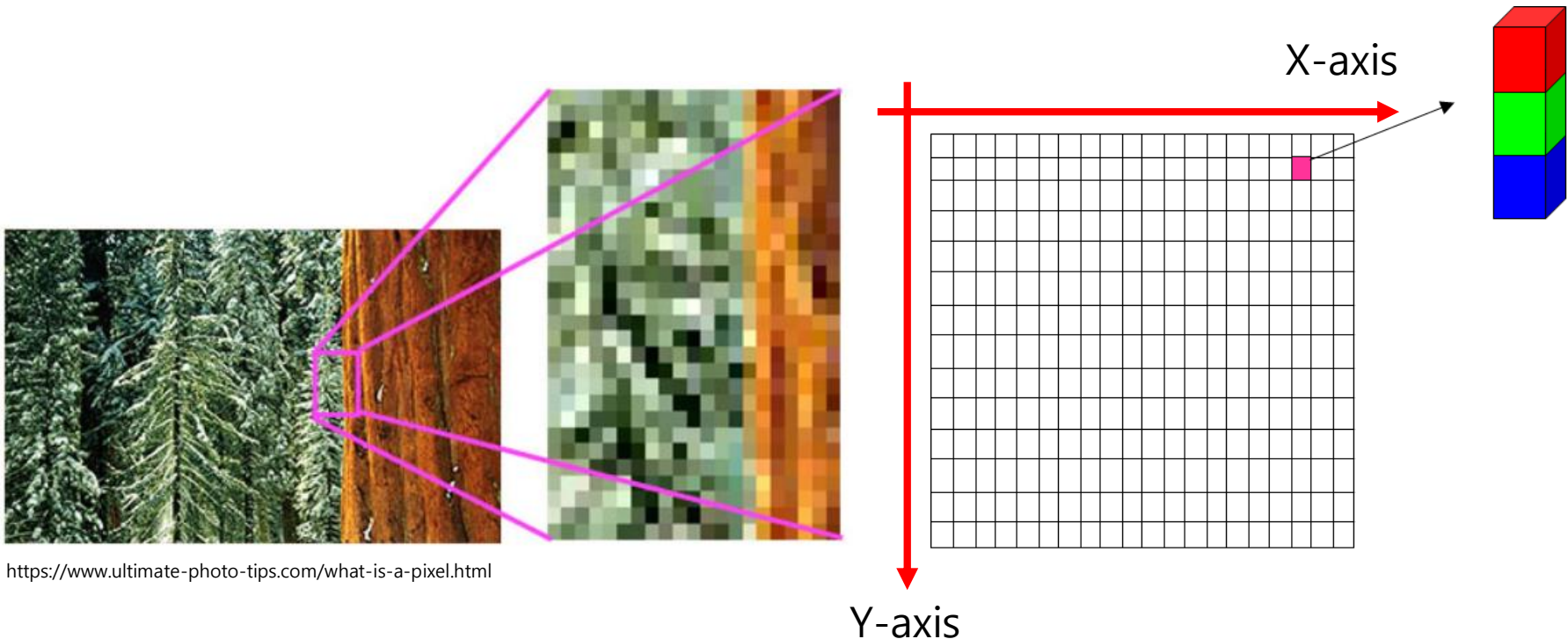


Basics of a Digital Image/Video

Sung Soo Hwang

Basics of a Digital Image/Video

- Every digital image is made up of pixels
 - Pixel means picture element
 - Pixels are the smallest unit of information that make up a picture
 - Each pixel may have multiple values
 - The location of a pixel is represented by 2D coordinates



Basics of a Digital Image/Video

- A digital video is made up of images
 - Images are taken with very short interval
 - Normally 33ms
 - Frame rate
 - The number of images(frames) of a video per second

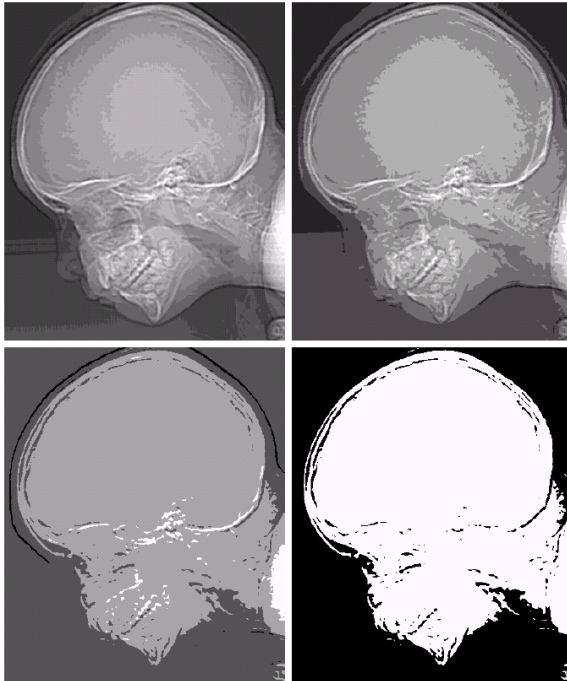


Low
frame
rate



High
frame
rate

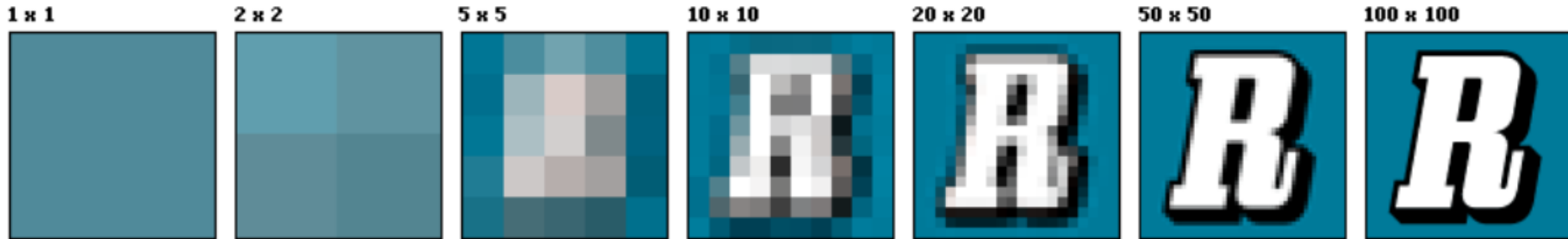
- Intensity level
 - Intensity level is typically an integer power of 2 $\Rightarrow L = 2^k$
 - The continuous range of light intensity is quantized to L gray levels
 - Normally $L=256$



Images with different intensity levels(16,8,4,2)

Basics of a Digital Image/Video

- Pixel resolution
 - The number of pixels in an image



VGA	640X480
HD	1280X720→1k
FHD	1920X1080→2k
QHD	2560X1440
UHD	3840X2160→4k

- Both pixel resolution and PPI(Pixels Per Inch) affect spatial resolution

- Total number of bits to store a digital image
 - M : the number of rows(height)
 - N : the number of columns(width)
 - k : the number of bits
 - ➔ $b = M \times N \times k$

- Assume that you have a video that is
 - Color video
 - FHD pixel resolution
 - 1 Hour
 - 30 fps
 - What is the total amount of bits?