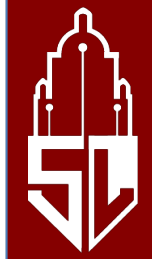


Lecture 2. Images and Transformations

Images, sampling and quantization

Juan Carlos Niebles and Jiajun Wu

CS131 Computer Vision: Foundations and Applications

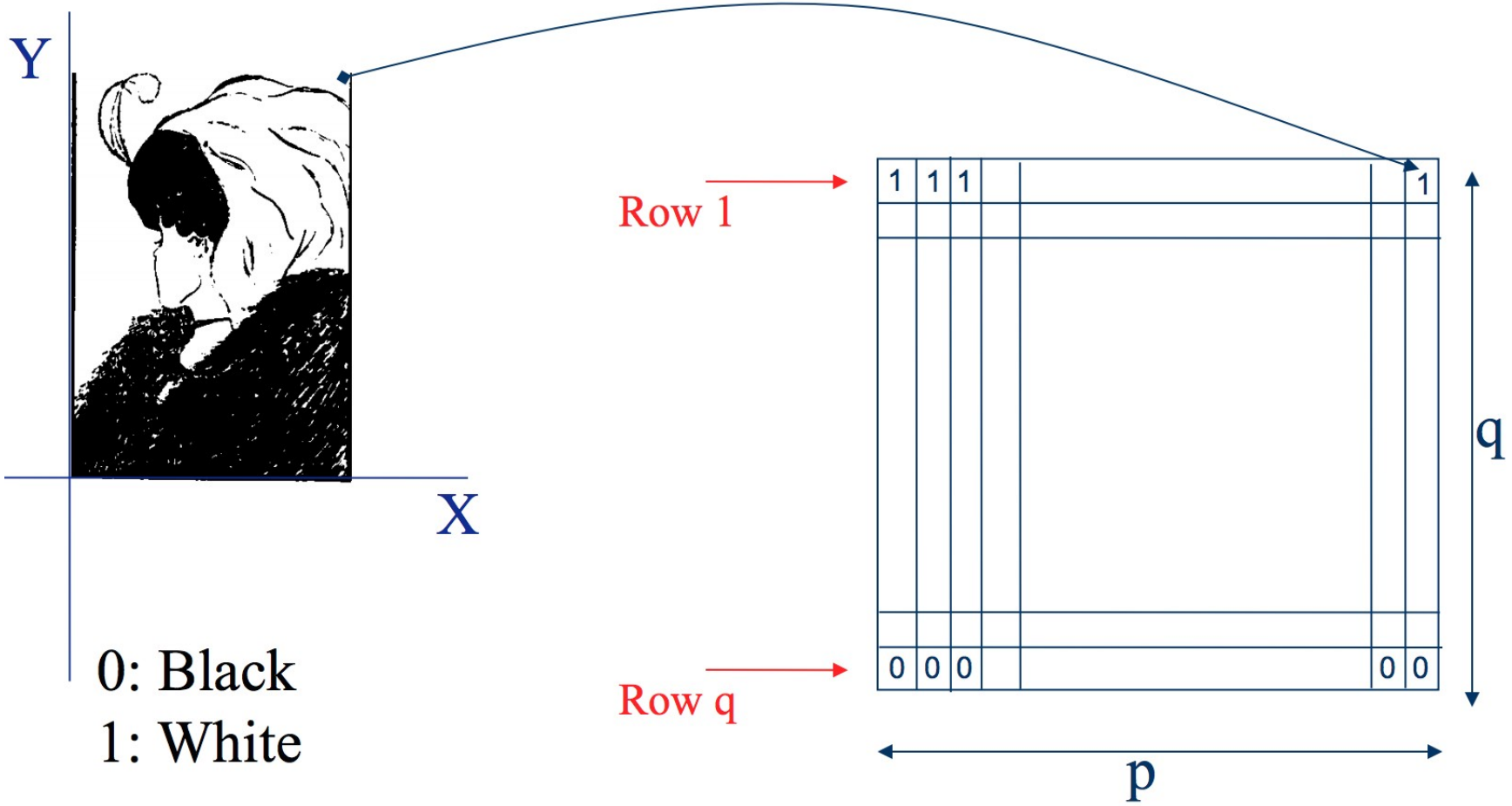
Types of Images

Binary

Grayscale

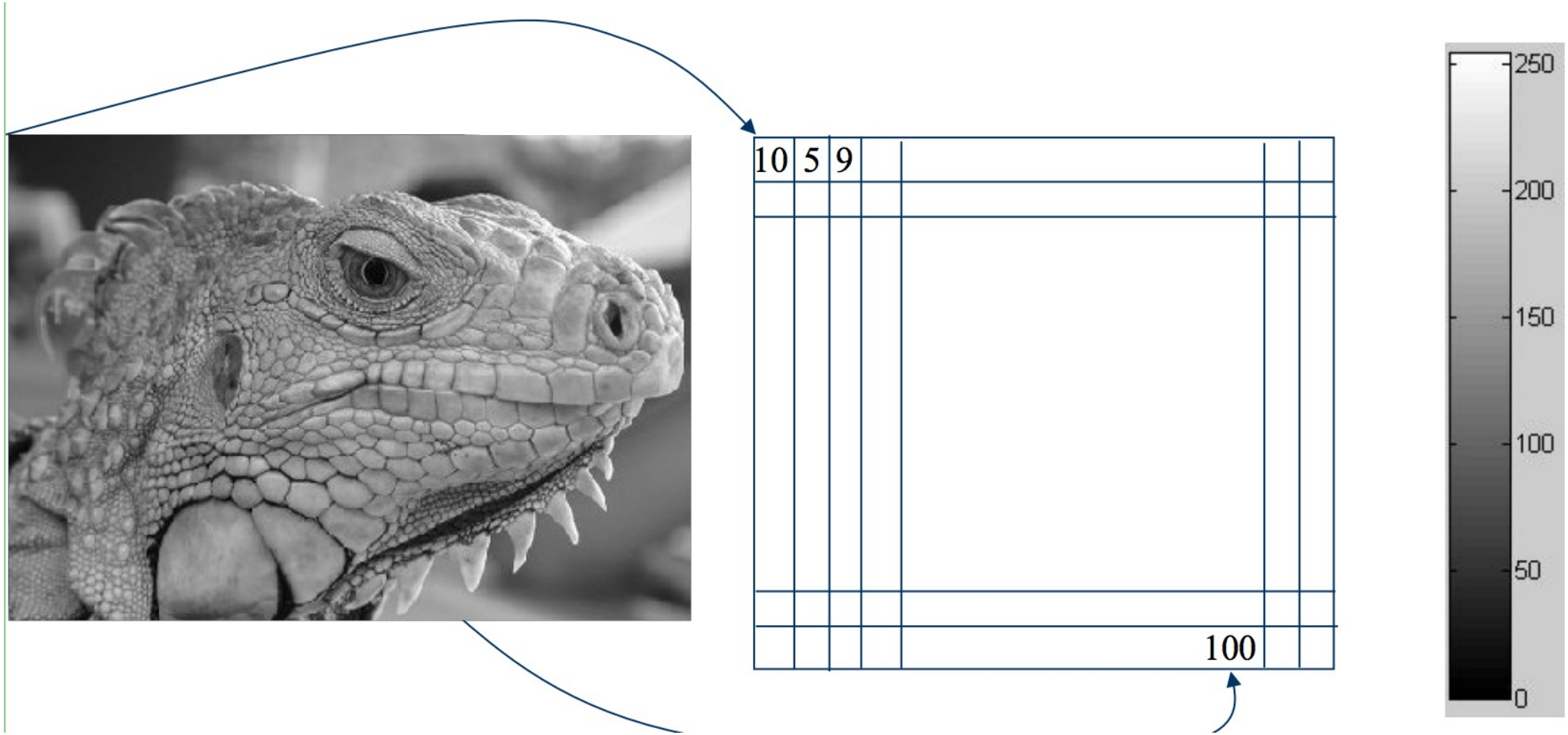
Color

Binary image representation



Slide credit: Ulas Bagci

Grayscale image representation



Slide credit: Ulas Bagci

Color image representation

B channel

G channel

R channel

Slide credit: Ulas

Color image - one channel

R channel

Types of Images

Binary

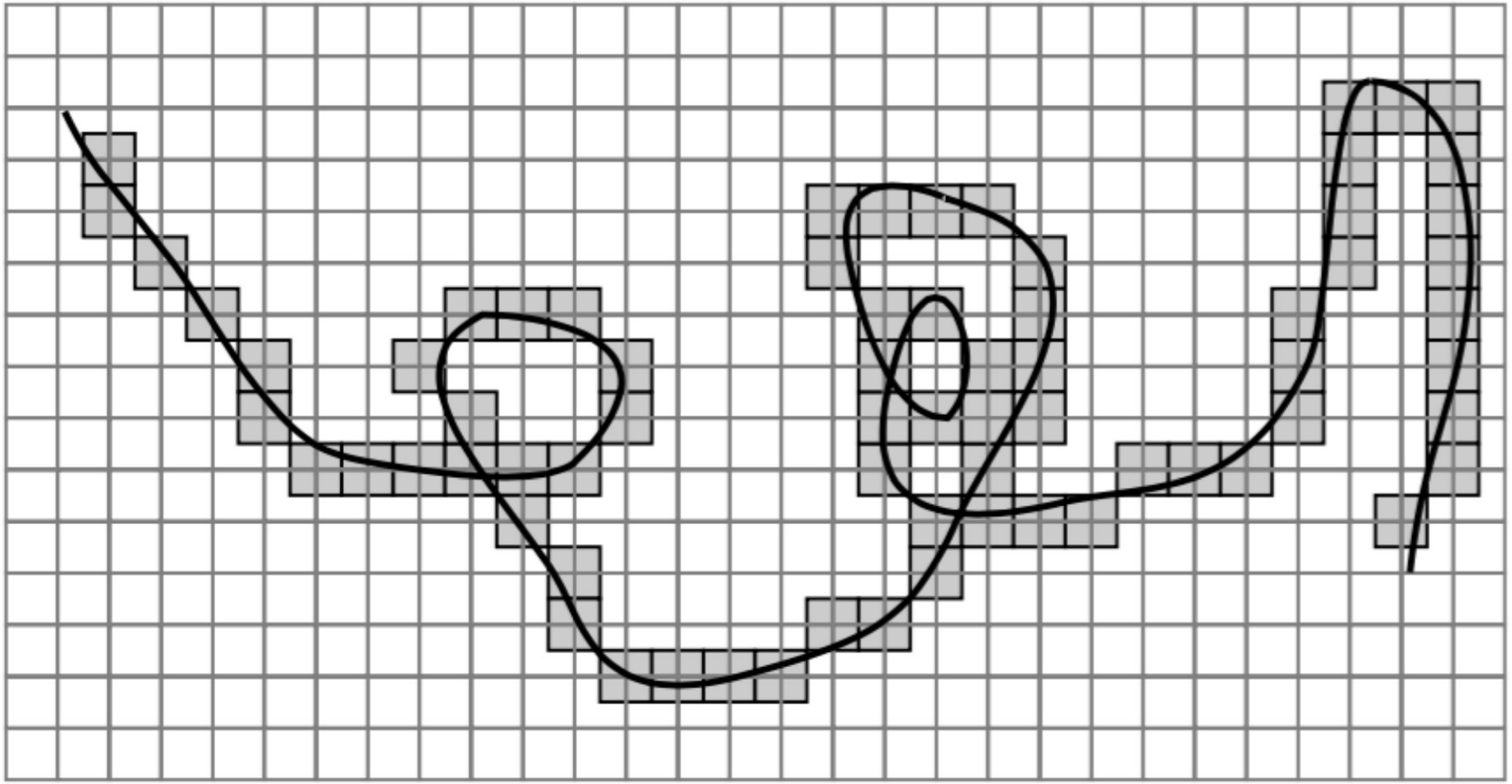
Grayscale

Color

Digital Images are sampled

What happens when we zoom into the images we capture?

Errors due to Sampling



Slide credit: Ulas Bagci

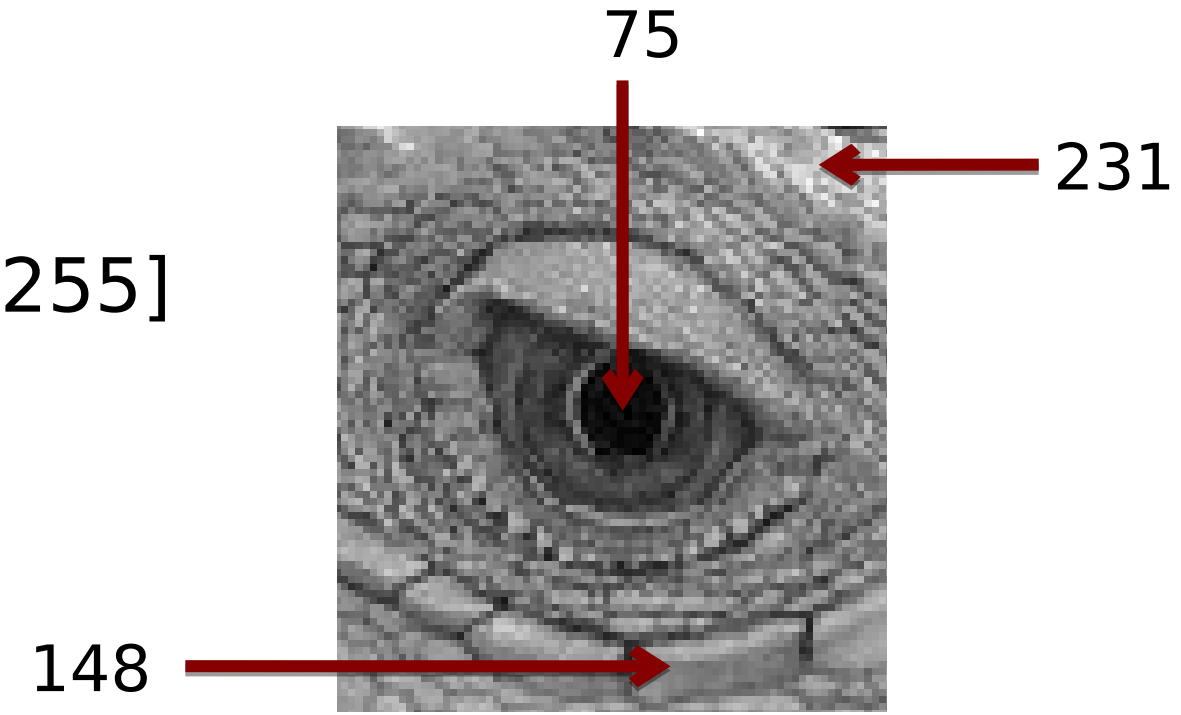
Resolution

is a **sampling** parameter, defined in dots per inch (DPI) or equivalent measures of spatial pixel density

Slide credit: Ulas

Images are Sampled and Quantized

- An image contains discrete number of pixels
  - Pixel value:
    - “grayscale” (or “intensity”): [0,255]



Images are Sampled and Quantized

- An image contains discrete number of pixels
  - Pixel value:
    - "grayscale" (or "intensity"): [0,255]
    - "color"
      - RGB: [R, G, B]

With this loss of information (from sampling and quantization),

Can we still use images for useful tasks?

Summary

- Image types (binary, grayscale, color)
- Images are sampled and quantized