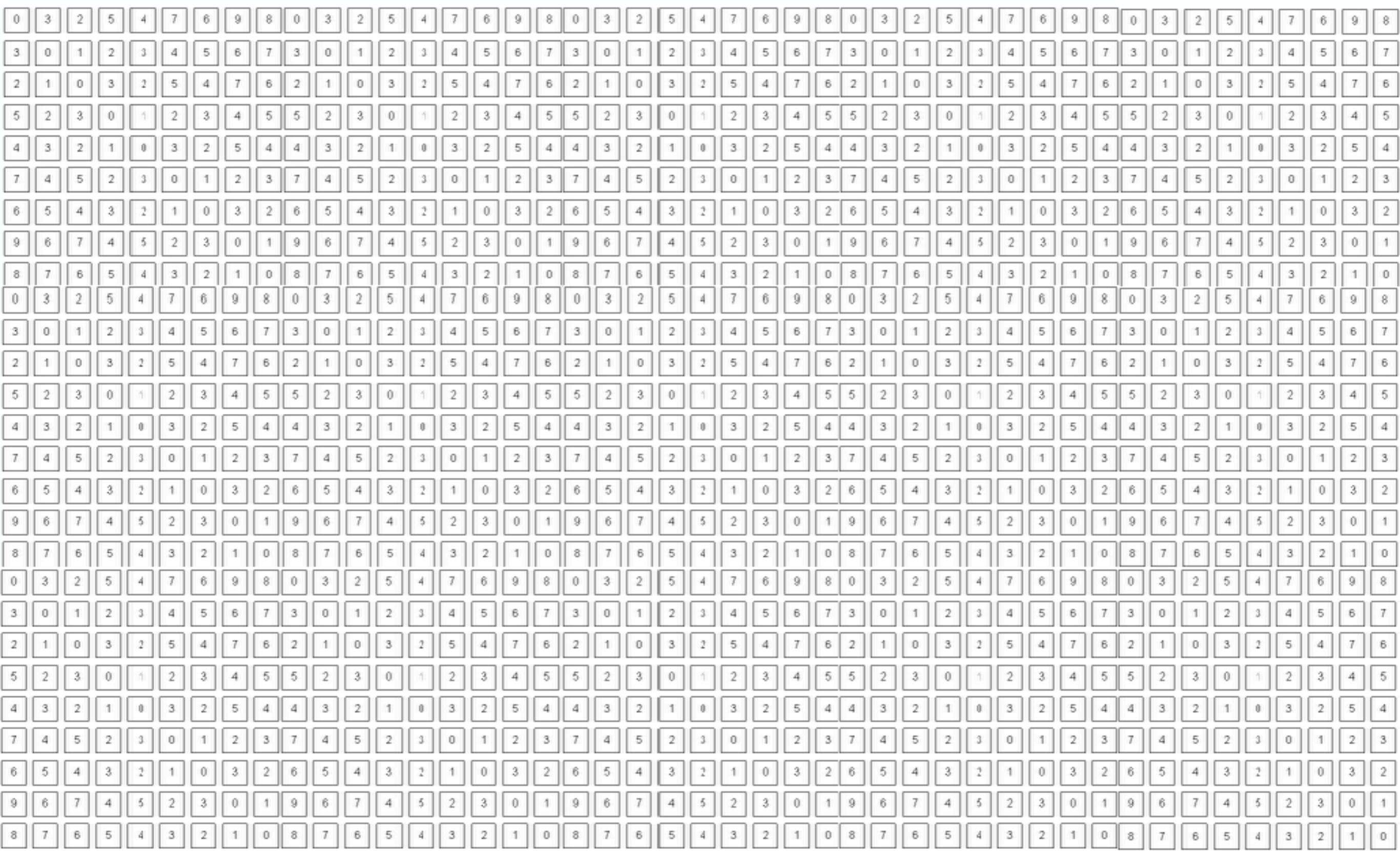


# **What is Digital Image Processing?**



**What a person sees**



# What a computer sees

Digital images are presented as a set of structured numbers in computers

The goals of Digital Image Processing are

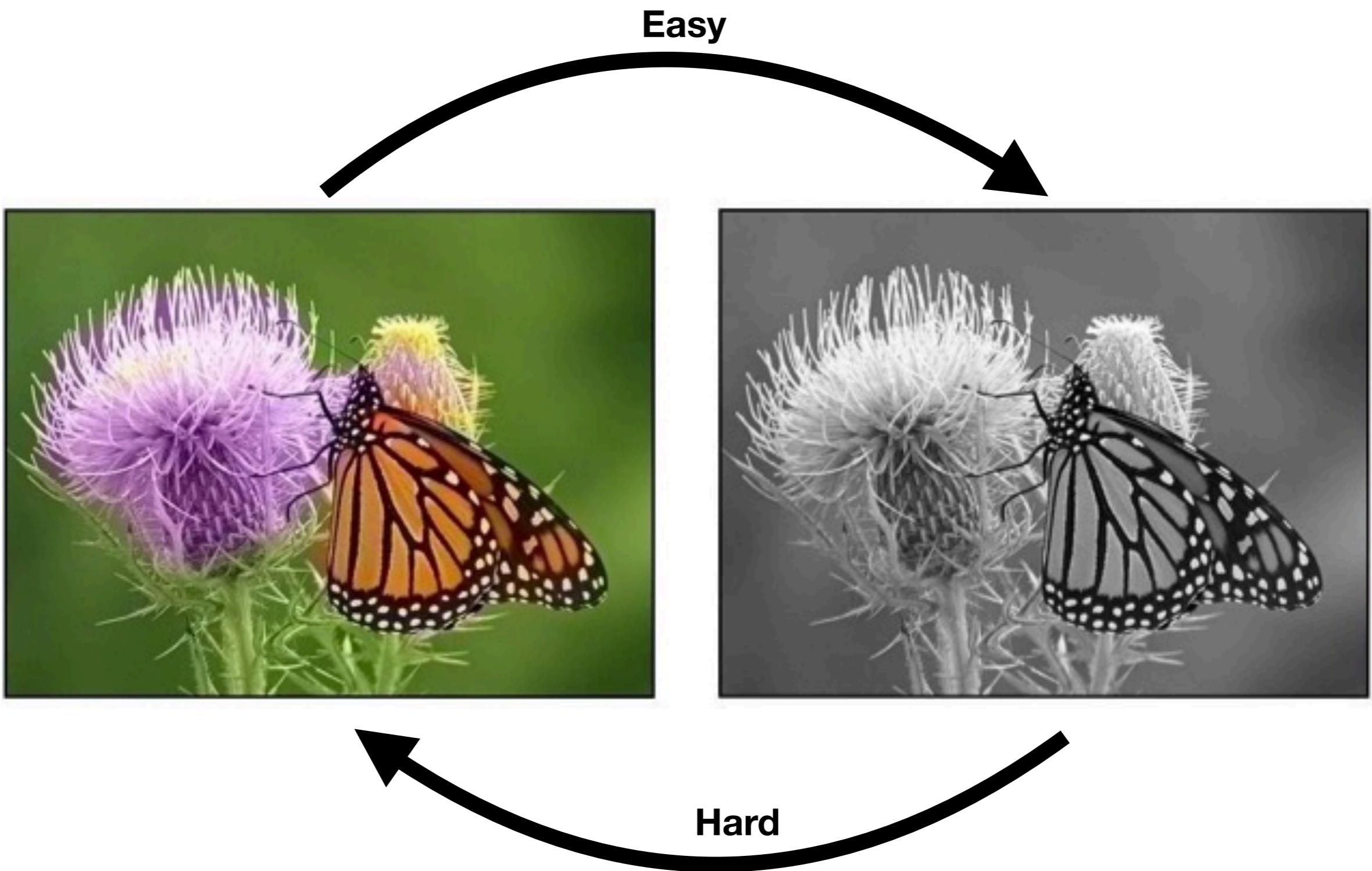
- To learn the fundamental concepts of Digital Image Processing
- To study basic image processing operations
- To understand image analysis algorithms
- To expose students to current applications in the field

(via your implemented algorithms, not photoshop)

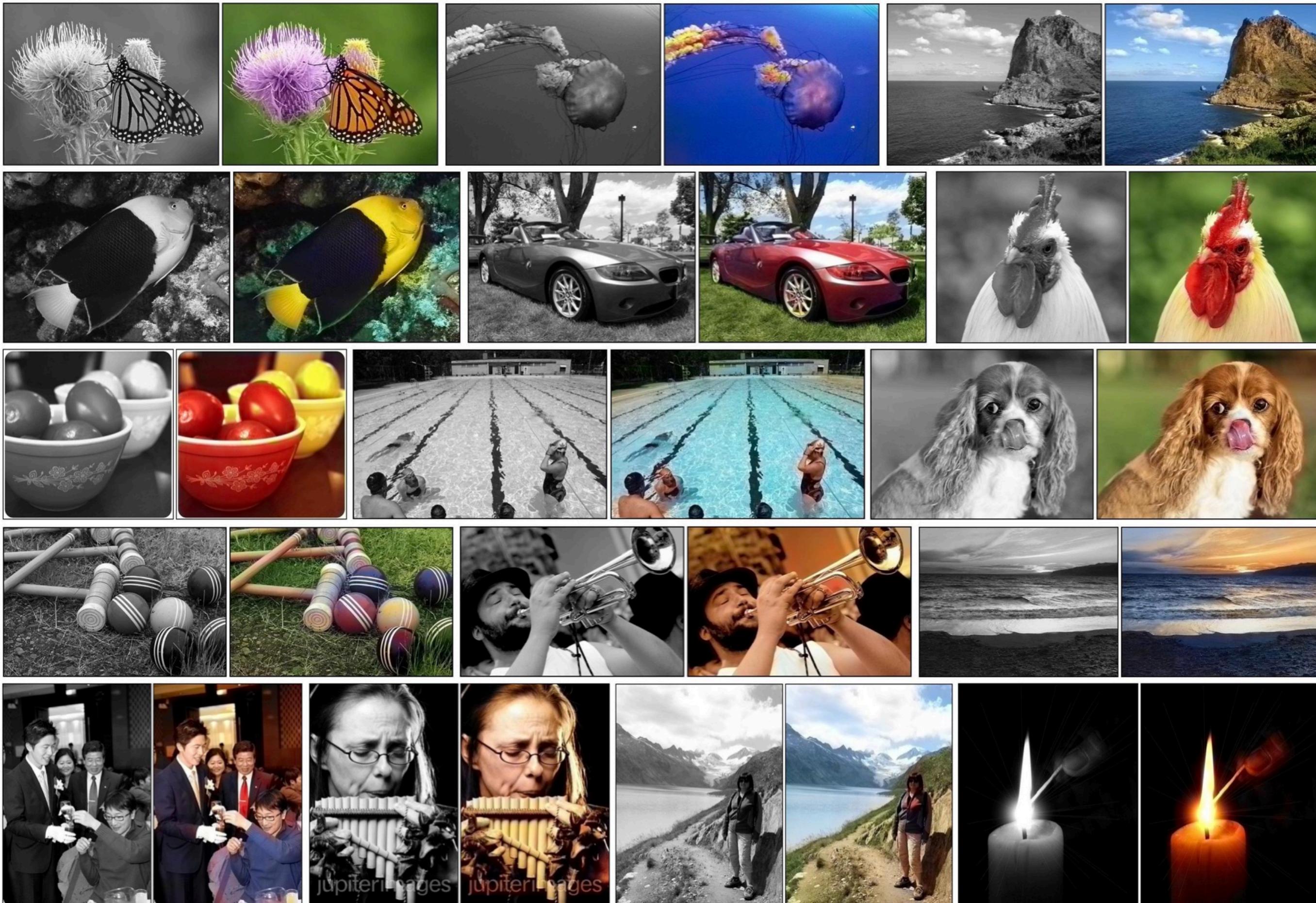
# Class Overview

- Understand the representation of digital images
- Spatial Domain Processing
  - Especially - Spatial Filtering
  - Especially - Convolution Filters, Convolutional Neural Networks (CNN)
- Frequency Domain Processing
  - Fourier Transform
- Color Image Processing
- Image Enhancement
- Image Feature Extraction
- Image Understanding
- Image Modeling

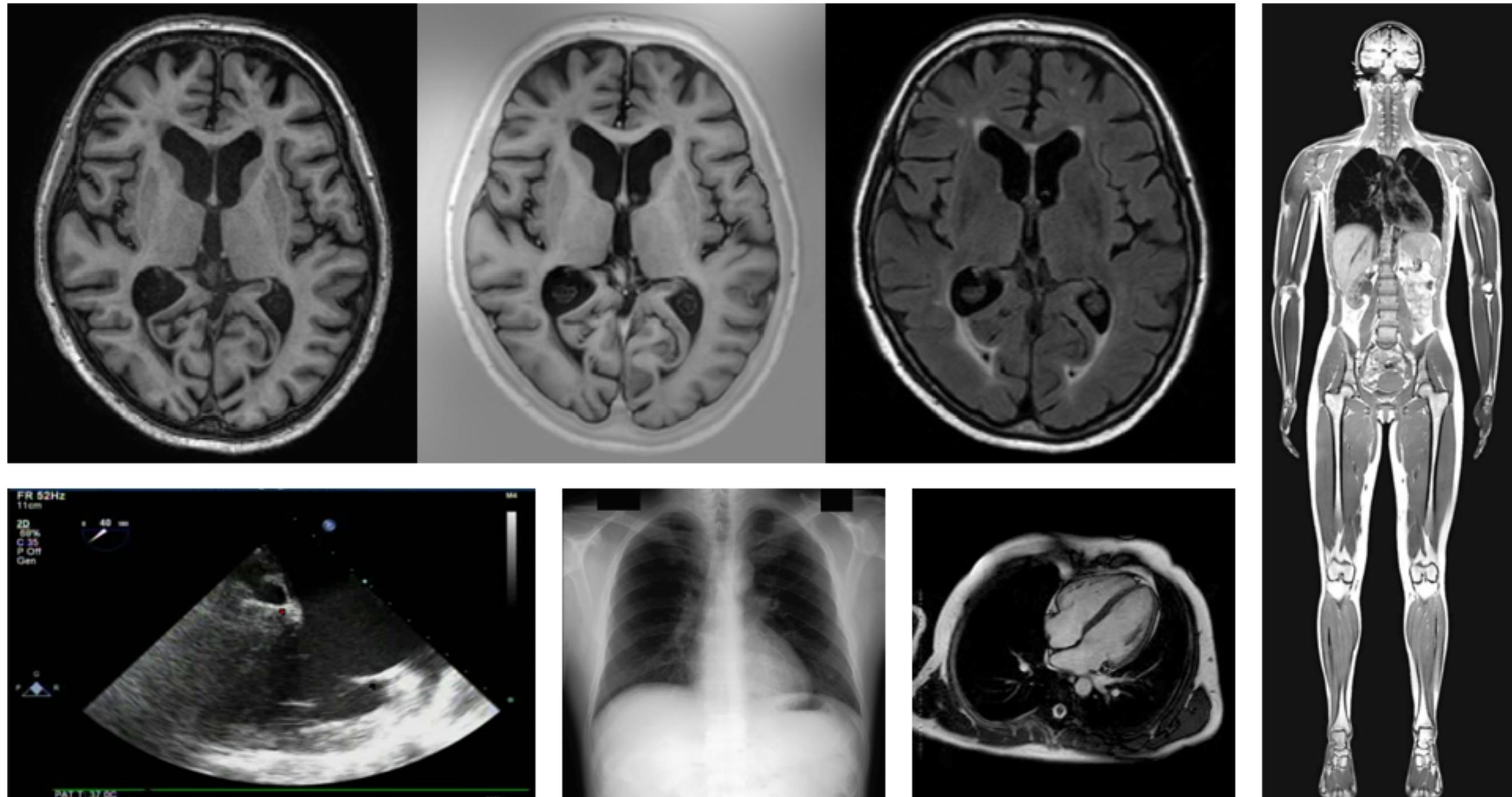
# Image Colorization



# Image Colorization



# Medical Image Processing



Examples of medical images (from top left to bottom right): Multi-sequence brain MRI: T1-weighted, T1 inversion recovery and T2 FLAIR channels; Stitched whole-body MRI; planar cardiac ultrasound; chest X-ray; cardiac cine MRI.

# Image Inpainting



# Video Inpainting

## Video Inpainting

Input



Our result



Jumping girl sequence

# “Head in the coffee beans problem”

Can you find the head in this image?



# “Head in the coffee beans problem”

Can you find the head in this image?







