Matlab Image Processing Toolbox
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- `imread`, `imshow`

- Image representation as a matrix
  - Image types: grayscale, RGB
  - Numeric types: uint8, double, logical

- Use of contrast stretching ("["]") in `imshow`
  - Example of pout.tif

- Use of `imtool`, `impixelinfo`

- Creating a simple synthetic image using “for” statements

- See list of functions in help browser

- Examples of some simple image processing functions
  - thresholding
  - addition, subtraction
Matlab Example

- `imread('pout.tif')`
- `imshow(I,[])`, `impixelinfo`
  - Or use `imtool(I,[])`
- Find a bright point in the image
- `line([x0 x1], [y0 y1], 'Color', 'w')`
- Is the x axis horizontal or vertical?
- In a Matlab program do you access $I(x, y)$ or $I(y, x)$?
Working with Images in Matlab

• Images are usually read in as type “uint8”
  – Range of values: 0..255
  – However, you can exceed range with some operations

• Solution: convert to double
  – Very large range, but takes 8 bytes per pixel
  – \( D = \text{double}(I); \) % straight conversion
  – \( D = \text{im2double}(I); \) % scales 0..255 to 0..1

• Many Matlab functions (such as imshow) treat a double image as having range 0..1 by default

• Remember to use “[ ]” with imshow
• figure – opens a new figure window