

Homework 01: Working with Images

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Handout: 2025-09-01

Due: 2025-09-08, 11:59pm, on Canvas

General Instructions:

- You should solve the homework and submit your report **individually**. Identical submissions will receive a grade of zero.
- Getting help from others or checking your answers with other students (not the TAs) is okay and encouraged.
- Ask any questions on **Ed Discussion** (instead of emailing).
- **Before** the homework due date, TAs are strictly prohibited from **pre-grading** your homework. Do not expect the TAs to help you verify if your answers are correct or give you the problem solution.
- **After** the homework due date, if you do not know how to solve a problem, reach out to the TAs. They will walk you through the solution and help you understand it. Note that homework solutions will **not** be posted because some problems will be used in next year's class.
- **Exams** may contain questions related to homework, so make sure you learn how to solve the homework problems correctly.
- The deliverables are outlined for each problem, and you should carefully **follow the instructions**. Failing to follow instructions will result in **points being subtracted**.
- You will submit a **single PDF** file to Canvas as your homework report. The PDF must contain your **answers** and any requested **outputs** (e.g., printouts, snapshots of code, or GUIs). If requested, follow the instructions specified by the problem to provide your **code** (e.g., in a compressed .zip or .tar file) in addition to the PDF file.
- **Grading:** Each homework in this class will contribute **5pts** to your final grade (there will be 12 homework assignments, each 5pts, leading to 60pts for all assignments). A detailed grading **rubric** will be posted on **Canvas** after the homework due date. Any bonus points will be added to your overall course bonus points, which will be added to your final grade.
- **Late submission:** Late or missed submission will not be accepted and will receive a grade a zero. Any excused absence must be documented and disclosed to the instructor (extensions will be granted on a case-by-case basis). Three or more missed homework lead to an INC grade.

IMPORTANT NOTE:

From now on, please make sure to carefully read and follow the instructions provided in each homework problem. For instance, this assignment specifically asks you to use a photo of yourself. This requirement helps us verify that the work is your own. Using any other photo will result in a deduction of points.

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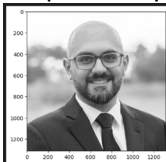
EXERCISE 1 (5pts) – The objective of this homework is for you to set up and test the course Conda environment on your machine (instructions provided in the [course GitHub page](#)). While you can do this homework outside this environment (e.g., using Google Colab), we will need/use this environment later in the course. Therefore, please set it up and debug any issues now rather than later. Do **NOT** use generative AI to solve this homework; otherwise, you will not learn to code!

Steps:

- Take a picture of yourself (e.g., a phone selfie) or use an existing headshot. Make sure your face is visible in the image.
- Using the `skimage` package in Python (included in our CV Conda environment) load your image.
- Convert the image into grayscale and into the `float32` format.
- Display the image on the screen (you can use the `matplotlib` library). Make sure to adjust the color map so that it is displayed in grayscale correctly.
- Print out the pixel values of the grayscale image as a matrix for the 3x5 pixels in the top left corner.
- What is the value of the pixel with x coordinate of 1 and y coordinate of 2 (assuming that pixel indexing starts at 1)? Print out this value.

Deliverables:

- Snapshot of your grayscale image, e.g.,



- 3x5 pixel value matrix for the top left corner.
- Pixel (1,2) value.