Content of the labs

- Lab 1 - Intro to Matlab; Intro to image processing in Matlab
- Lab 2 - Fundamentals of image processing in Matlab, histogram, contrast adjustment histogram equalization
- Lab 3 - Convolution, filtering, image correlation
- Lab 4 - Edge detection
- Lab 5 - Binary Image processing
- Lab 6 - Image segmentation
- Lab 7 - Feature detection and extraction
- Lab 8 - Classification
- Lab 9 - Assignments, Project work

Format of the lab

- Lab topics are announced 1-week before and are uploaded 1-day before on Teams in the Files tab -> **Labs**
- We start with a plenary session introducing the concepts of the lab.
- For **online format**, we then split into “breakout rooms” (main room + 2 others).
- For physical format, we will be available in-person for questions and troubleshooting
- The lab will include demos with Matlab in-built functions.
- Then, some tasks for you to do: partly, to implement from scratch some of the functions, partly to be able to employ the in-built functions for applied problems.
- Depending on the pace, the solution is presented after the lab. If not, discussed in the beginning of next lab.

Introduction to Matlab

IDATG2206, Spring 2022

Matlab is/has…

- A proprietary licensed software developed by MathWorks.
- A **high-level** scripting language.
- Has an extensive function library for scientific problem-solving.
- Useful for fast implementations.
- Useful for quick simulations of an idea/prototype in industry.

Matlab Resources

- Matlab Toolboxes (developed by MathWorks).
- Matlab File Exchange (developed and shared by the community).
- Matlab Help and Documentation (a “living” resource).
- Datasets of images and numeric data, that come with the installation, useful for function demos.

Matlab GUI

- Command window
- Editor Window
- Workspace window
- Variable window
- Current folder window

Other essentials

- 1-indexing language.
- Both scripts and functions called inside scripts are written in files with the .m extension.
- We will be using the **“Live Script”** functionality (that from an *.m* file generates and *.mlx* file) for showing the results in the editor as we run them
- To open an existing script (.m) as a live script (.mlx) from the Editor, right-click the document tab, and select Open scriptName as Live Script from the context menu.
- To generate an .html page from existing script (.m), go to Publish tab in the menu -> click Publish

Matlab Functions

- Syntax: *function [y1,...,yN] = myfun(x1,...,xM)* declares a function named myfun that accepts inputs x1,...,xM and returns outputs y1,...,yN.
- You can save your function:
  - In a function file which contains only function definitions. The name of the file must match the name of the first function in the file.
  - In a script file which contains commands and function definitions. Functions must be at the end of the file. Script files cannot have the same name as a function in the file.