Projects - Course 71254 - Introduction to Image Processing (2025)

Congratulations, you have reached the final part of the course! In this part you will be working, submitting, and presenting in pairs. Should you not find a suitable partner, please let me know and I will try to assist you.

Important dates:

- 19/12/2024 – Approve your topic with Yehuda\Yedidya before starting to do massive work.
- 16/01/2025 – In-class work on projects, assistance from Yehuda\Yedidya.
- 23/01/2025 – Presentation approval + In-class work on projects, assistance from Yedidya/Yehuda.
- 30/01/2025 – Presentations (guests may be invited).
- 09/02/2025 – Project hand-in (the entire report, Python code, dataset, etc.)

Phase #1

Choosing a topic (agricultural/environmental) to work on, based on one of the following:

1. Published work (scientific article, any research field), public database (it can be from Kaggle).
2. Unpublished dataset from a scientific lab at the faculty.
3. A dataset that you acquire yourself.

that involves **image processing.** You are to present the scientific question that is raised by this dataset and get my approval to work on the subject.

Phase #2

Coding.

You are to use Python to address the question presented in phase #1. You are to implement what you've learned in the course, and are more than welcome to use methods that we didn't learn.

Use the internet for help - you are probably not the first people on earth to get in trouble with the specific code lines you want to write. I am also available for questions, of course.

Phase #3

Presentation.

You will present your work to all the students in class, and any visitors you would like to invite.

You will prepare a presentation that describes your work. Specifically, address the following topics:

1. Scientific background - describing in short, the research field.
2. The database itself - how was it obtained, what does it contain.
3. The scientific question.
4. Your methods.
5. Your results + discussion + conclusion (if you already have)
6. Future work - how would you continue this project if you had more time? The presentation should not take more than 10 min.

Phase #4

Writing and handing in your files (~7-10 pages, excluding supplementary material). Submit (Moodle) a PDF file containing the following items:

1. **Cover page** (title, name of authors, date, course number)
2. **Introduction:** scientific background
3. **Database:** examples of the data contained in the database, its type (image format, size, amount, etc.), how and where it was obtained from. Include a link to the data itself.
4. **Results**
5. **Discussion**
6. **Conclusions**
7. **Bibliography**
8. **Supplementary material:** your Python code (link to the the project repo on GitHub) and other documents used in the project (refer to available links).

Final notes:

- Please use referencing software (such as Mendeley) in your text and use number indexing.
- Use 12pt font, and 1.5 linespacing.
- Your code must be super organized in a Colab Notebook, and well commented. Use markdown cells, headings, explanations, and clean code.

Project evaluation – your assignment will be evaluated according to the following criteria:

- 30% Class presentation
- 15% PDF/IPYNB presentation: How the images/graphs look, labels, general organization, markdown cells, clean code.
- 20% PDF file contents: This is where you explain what you did, what you found out, etc.
- 15% Depth of coding/analytical analysis: You can analyze/explore your data with different levels of complexity. Using various image processing tools, statistics analysis, etc.
- 15% Replicability: Your code runs flawlessly.
- 5% Code commenting: Explain in your code what you are doing, this is good for everyone, especially for yourself!

* Evaluation criteria credit: Dr. Yair Mau (Soil & Water Sciences Department)