Final project in an image processing course

Evaluation of the final project:

The final project for this course will be completed and presented in pairs. If you are having difficulty finding a suitable partner, please inform us, and we will assist in pairing you with someone.

Novelty	5%	
Phase 1# Proof of concept	20%	רקע ספרותי, סקירת ספרות
Phase 2# Coding	20%	
Phase 3# Presentation	20%	
Phase 4# Report	35%	

Key Topics and Important Dates:

- **Project Initiation:** Start working on your project independently at home. Before you start extensive work, please get your project topic approved by us.
- **Presentation Approval and Class Work**: Send us an email to approve your presentation topics. If you have any questions we will set an individual meeting to go over your project.
- **Presentations:** You will present your projects to the class. Guests may be invited to attend these presentations.
- **Project Submission:** Submit the complete project, including the full report, Python code, dataset, etc.
- **Important Reminder about Teamwork**: Ensuring equal distribution of roles and responsibilities among team members is crucial. Any significant discrepancies in contributions will be reflected proportionally in the individual grades.

Phase #1: selecting topic.

For your final project in this image processing course, choose a topic that aligns with one of the following areas: agriculture, environmental science, engineering, military, medicine, or security. Your project should be based on one of the following options:

Published Work or Public Database: Utilize a scientific article from any research field or a dataset from a public database, such as Kaggle.

Unpublished Dataset from a Faculty Lab: Work with a dataset that is yet to be published, originating from a scientific laboratory within our faculty.

Self-Acquired Dataset: Collect a dataset independently for your project.

Idea Generation:

a. Suggest creating a pioneering idea (start-up) in computer vision and image processing that tries to solve the problem in one of the topics mentioned above.

b. Conduct an extensive brainstorming session to develop 2-5 novel ideas or identify new applications for existing technologies.

c. Integration of Course Topics: Your project must incorporate **at least four** topics covered in our image processing course. Present the scientific question your chosen dataset raises and ask for our approval before proceeding with the project.

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לבחור תת נושא אחד מתוך המצגת

Phase #2 Coding.

In this phase, you will use Python to address the questions identified in phase #1. Apply the knowledge and skills you have acquired throughout the course and insights gathered from relevant literature. Feel free to incorporate new models not covered in class, but ensure that you include **at least four** topics from our image processing course syllabus.

a. **Literature Review:** Conduct a thorough literature review on your chosen topic. Others have likely encountered similar challenges with the specific code you plan to write, so researching existing solutions can provide valuable insights.

b. **Concept Selection:** As a team, decide on the concept that resonates most with your collective vision. This decision should be based on the literature review and the specific challenges of your project.

c. **Development of Proof of Concept:** Create a proof of concept for your project. This can range from a high-level workflow diagram to a foundational script or even a preliminary application, depending on the scope of your project.

d. **Balance in Approach:** Strive for thoroughness in your work, but remember not to get bogged down in seeking perfection. Developing a functional and coherent project is more important than a flawless one.

NB! The code that you are going to submit should be well structured and commented. If it requires any side solutions to run, include instructions for installations.

Please remember that we are available to answer any questions during this process.

Phase #3: Presentation.

You will present your work to the class and any guests you wish to invite are welcome. Your presentation should effectively describe your project, covering the following key points:

a. **Scientific Background**: Briefly introduce the research field related to your project. This should set the stage for the context of your work.

b. **Database Overview**: Explain how you obtained the database and detail its contents. This helps in understanding the foundation of your project.

c. **Scientific Question**: Clearly articulate the scientific question your project addresses. This is the core of your research.

d. **Methods:** Describe the methods you used in your project. This should include any specific approaches, techniques, or tools you employed and specify the four topics covered in our image processing course.

e. **Results:** Focus on your results and insights if you are still in the early stages.

f. **Discussion and Conclusion**: Present any findings, discussions, and conclusions you have reached.

g. **Future Work**: Share ideas on how you would expand or continue this project if given more time. This shows the potential and scalability of your work.

h. **Presentation Duration and Q&A**: Your presentation should be no longer than **10 minutes**, followed by a **5-minute** session for questions. Be prepared to answer a range of questions following your presentation.

Phase #4: Report Writing

You are required to write and submit a comprehensive report of your project. The report should be not incl. bibliography approximately 8 pages long, not including any supplementary material. Submit your report as a PDF file on Google drive, including the following components:

a. **Cover Page**: This should include the title of your project, the names of the authors (team members), the date, and the course number.

שני עמודים של סקירת ספרות b. **Introduction**: Provide a scientific background relevant to your project. This section should set the stage for your research question and methodology.

c. **Database Description**: (1) Examples of Data: Showcase examples from the database used in your project. (2) Data Characteristics: Describe the type of data (image format, size, quantity, etc.). (3) Data Acquisition: Explain how and where the data was obtained. (4) Data Access: Include a link to access the data.

d. **Results**: Present the findings of your project.

e. **Discussion**: Discuss the implications and significance of your results.

f. **Conclusions**: Summarize the key takeaways and conclusions drawn from your project.

g. **Bibliography**: Include a list of references used in your project. Ensure the bibliography is formatted correctly, using referencing software such as Mendeley and number indexing.

h. **Supplementary Material**: Attach your Python code and other documents utilized in your project. Ensure any links to additional resources are available and functioning.

Final Notes for Report Submission:

Formatting: Use a 12pt font size and 1.5 line spacing throughout the report.

Code Organization: Your Python code should be exceptionally well-organized and thoroughly commented on. Use markdown cells, headings, clear explanations, and clean, readable code.

Good luck!

לגבי נושא - אפשר להיפגש איתם להתייעצות

מציגים ב-14/3