MVA DLMI Course
Guidelines for the evaluation

Note: all deadlines are hard (for every day after the deadline, the grade will be decreased by one point, so if you are 5 days late, you lose 5 points over 20)

The evaluation of the course is composed of two parts: 1) challenge; 2) article synthesis. Each is graded on 20 points and the final grade for the course is the average of the two grades.

All documents need to be in English (written documents, posters, comments in the code…).

For each of these, you will need to work in pairs (“binome”). The pairs should be the same for the two assignments.
If the numbers of students in the class is odd, there can be either one singleton (one person working alone) or one trio ("trinome"). There should be only one singleton or one trio and all other students should work in pairs (binome).
For a singleton, you will need to return the same material as a binome.
If there is a trio, please be aware that our expectations will be higher than for a binome :
- for the Challenge, we expect a more sophisticated solution and you will need to better put the method into context by doing a literature review. The report will be 8 pages instead of 5.
- for the Article synthesis, you will need to present two papers instead of one, you will need to submit two reports and two posters

You need to register in the Google Sheet. Make sure that you register in both sheets (both sheets are in the same document): “List of students” where there should be a student per line and “Pairs (binome)” where each line should correspond to a pair (or singleton or trio). If you don’t know another student to form a pair, you can see the list “List of students” and check those who don’t have a team and ask them to team you with you.

Deadline for completing the Google Sheet: Tuesday January 30th

1. Challenge

You will be participating in a challenge for a medical image computing problem. The challenge will be announced on Piazza.

Material to return

- A submission on the competition webpage.
- A 5-pages report (see details below) [8 pages for a trinome]. Please ensure that both your real names and the name of your team appear on the report.
- Code corresponding to your contribution

Deadline

March 28th

How to submit

You need to submit:

- Challenge submission: submission of your solution on the platform (team submission – pick also a name for your team).
- Report: typeset your report (PDF file only). In your report, you should mention the name of your team on the plateform, and the names of all team members. The file name should be *DLMI_Challenge_Report_LastName1_LastName2.pdf* (*make sure the names are in the same order as in the GoogleSheet*). Upload the file on some cloud service such as Google Drive for instance (make sure there is no need to enter a password or login) and put the link in the column “Challenge report link” of the Google Sheet.
- Code: prepare a .zip file containing the code that is needed to reproduce your submission. The file name should be *DLMI_Challenge_Code_LastName1_LastName2.zip* (*make sure the names are in the same order as in the GoogleSheet*). Upload the file on some cloud service such as Google Drive for instance (make sure there is no need to enter a password or login) and put the link in the column “Challenge code link” of the Google Sheet.

Formatting of the report for the challenge

The reports should follow the formatting of the MIDL conference provided here: https://github.com/MIDL-Conference/MIDLLatexTemplate (use midl-fullpaper and not midl-shortpaper). The page limit is strict. The bibliographic references don’t count in the page limit (5 pages for pair, 8 pages for trio). You should send us only the compiled PDF and not the LaTeX files.

Evaluation criteria - Grading

Grading will be on 20 points total.

Performance and code (9 points)

1. Performance (7 points)
    a. 7 points will be allocated based on raw performance only, provided that the results are reproducible. That is, using only your code and the data provided on the competition page, we should be able to train your final model and use it to generate the predictions you submitted for scoring. Also, don’t worry, the grading will not be a direct translation of the ranking (i.e. even with a poor rank, you can get a very decent grade if you provide a well-explained, reproducible model).
2. Code (2 points)
3. Code completeness, organization and readability (2 points)
    a. Best submissions will provide clear, well organized and commented code.

Report (11 points)
The 5-page report should include the following sections (in this specific order):

- Introduction: (1 point)
    - Explain the problem
    - Put the chosen components in context
- Section 1: Architecture and methodological components (5 points). Regardless of the performance achieved, we will reward the research efforts and creativity put into the architecture (e.g., model definition, modules, functions). You are expected to:
    1. Explain the motivation and intuition behind your architecture. How did you come up with new models? What is it intended to capture? Did you discard others?
    2. Rigorously report your experiments about the impact of various combinations of blocks, architectures on predictive performance, and, depending on the model, how you tackled the dataset.
- Section 2: Model tuning and comparison (4 points). You are expected to:
    - Compare and prepare an ablation study with the different components of your method.
    - Explain preprocessing steps or other tricks that helped your model perform well for this problem and facilitated your training.
    - Report the performance on the different sets, the hyperparameters of your method as well as the score on the test set (given by Kaggle).
    - Discuss about any additional models that you have tested but did not perform well.
    - We will also assess the quality of the internal validation procedure. It needs to be unbiased so that there is only minimal discrepancy between the internal validation and the challenge test set. It needs to be clearly described in the report.
- Report readability (1 point)
    - Report organization and readability will be worth 1 point. Best submissions will clearly deliver the solution, providing detailed explanations of each step.

2. Article review and poster

You will be given a scientific paper in the field of the course. You will need to make: i) a review of the paper; ii) a poster summarizing it.

Material to return

- A 2-page review of the paper (2 reviews for a trio)
- A poster summarizing the paper

Deadlines

- **March 18th** for returning all documents (review and poster)

- You will need to present your poster on-site during the last course on **March 28th between 13h45 and 17h.**

How to submit

You need to submit:

- Review (PDF file only). In your review, you should mention the names of all team members. The file name should be *DLMI_Article_Review_LastName1_LastName2.pdf* (*make sure the names are in the same order as in the GoogleSheet*). Upload the file on some cloud service such as Google Drive for instance (make sure there is no need to enter a password or login) and put the link in the column “Article review link” of the Google Sheet.
- Poster (PDF file only). In your poster, you should mention the names of all team members. The file name should be *DLMI_Article_Poster_LastName1_LastName2.pdf* (*make sure the names are in the same order as in the GoogleSheet*). Upload the file on some cloud service such as Google Drive for instance (make sure there is no need to enter a password or login) and put the link in the column “Article poster link” of the Google Sheet.

Formatting of review

The review should follow this template:
https://www.overleaf.com/articles/the-line-of-best-fit-via-transformations/gjsmndqcscyw
The page limit is strict (2 pages). The bibliographic references don’t count in the page limit. You should send us only the compiled PDF and not the LaTeX files.

Formatting of the poster

Your poster needs to be in **A1 portrait format (if you are unsure what is a portrait, as opposed to landscape, format, please check it)**. You can prepare it using Powerpoint, Latex or any other software but you need to submit a PDF. Also, even if the poster will have the names of the authors of the paper, please put your own names somewhere as well as your group number (line number in the Google Sheet) because it will make our task easier during the on-site presentation.

Guidelines for the review

A review is a critical assessment of a paper. Here are the components that your review should provide. A review needs to be very clear, informative and comprehensive, pointing to specific sections/ claims of the paper. For each point that you will raise you need to support it, to make it very clear for the authors. You may consider taking a look at this post for more details on how to write a good review (https://www.science.org/content/article/how-review-paper).

1. Paper summary (1 page)
    a. Describe what the paper is about

        i. What is the methodological and/or medical problem that is being addressed? Why is it important?
        ii. Describe briefly how the paper addresses the problem
    b. Describe its positioning with respect to the state of the art
        i. If relevant, find a few methods from the course that could be applied to this problem
        ii. Look at the references cited in the paper.
        iii. Do an additional non exhaustive literature search on the topic
        iv. What are the limitations of the existing approaches that the present paper aims at overcoming?
    c. Describe the main contributions of the paper
        i. What are the novelties in terms of methodology and/or experiments?
    d. Describe the methodology
    e. Describe the validation and results
        i. What data was used?
        ii. What validation procedure?
        iii. Describe the main results
2. Critical assessment (1 page)
    a. Paper strengths with detailed explanation and clear point.
        i. For instance
            1. Novel method
            2. Novel application
            3. Rigorous methodology
            4. Rigorous experiments
    b. Paper weaknesses with detailed explanation and clear point.
        i. For instance
            1. Lack of novelty (needs to be justified)
            2. Errors in the methodology
            3. Problems with the validation
            4. Identify unsubstantiated claims if there are any
            5. Limitations of the study
                a. Either limitations described by the authors
                b. Or limitations that you identified
    c. Recommendations for improvement
        i. Provide a constructive feedback on how the paper could be improved

Suggestions for the poster

The poster should describe the content of the article.
You can find some examples of scientific posters here:

- https://hal.science/hal-03365775
- https://hal.science/hal-01245909
- https://hal.inria.fr/hal-02430943

Here are some suggestions of things you can include in the poster. It is not mandatory to follow it, this is here to help you.

1. Background
    a. What is the methodological topic that the paper deals with?
    b. What is the medical problem that is being addressed? Why is it important?
    c. What is the state-of-the-art on that problem?
    d. What are the limitations of the existing approaches?
3. Objectives and main contributions
    a. What is the objective of this paper? (one sentence)
    b. What are the main contributions
    c. Which data was used to train and validate the method?
4. Methodology
    a. Describe the methodology
    b. For each component, try to motivate why it is introduced
5. Validation and results
    a. Describe the validation procedure
    b. Describe the main results
        i. Be non exhaustive, identify the results which are the most important
6. Conclusions
    a. Summarize the main conclusions of the paper
7. For Figures and Tables, you can insert snapshots from the paper

Evaluation criteria - Review (10 points)

1. Paper summary (5 points)
    - Understanding what the paper is about
    - Understanding its positioning with respect to the state of the art
    - Identifying the main contributions of the paper
    - Describing accurately the methodology
    - Describe accurately the validation and results
2. Critical assessment (5 points)
    - Ability to identify the strengths of the paper
    - Ability to identify the weaknesses of the paper
    - Quality of the recommendations for improvement
        - The feedback must be accurate and constructive (i.e. this should describe things that could actually be done to improve the paper)

Evaluation criteria - Poster (10 points)

<u>Note that all components will be assessed both using the preread of the poster and the onsite presentation</u>

1. Putting the paper in context (2 points)
    - Describe the methodological topic the paper is dealing with
    - Understand the medical problem the paper is addressing
    - Explain the limitations of existing approaches

2. Describing the methodology (3 points)
    - Understand the key methodological components
    - Understand why these components are introduced
3. Describing the evaluation and results (3 points)
    - Understand and describe the validation procedure
    - Analyze whether the conclusions of the paper are supported by the results
    - Identify the limitations
4. Formal quality of the poster (2 points)
    - Organization of the document
    - Clarity of the explanations
    - Quality of the phrasing