Signal and Image Processing by Computer – Spring 2016

Final Project: Instructions

- Submission is in pairs.
- The project presentation day will be scheduled (probably to October\November 2016), and the submission will be on that day.
- Your attendance throughout the presentation day(s) is mandatory.
- The presentations and documents will be written in English, using Word/Power-Point or in Latex. In case you are submitting PDF files you are required to submit them also in an editable format.

Selecting a Project

1. The suggested project list will be separately published.
2. Each student pair will send an e-mail to the TA (ydar@cs) with the following details:
   a. Names and e-mail addresses of the students.
   b. The titles of the three preferred projects from the list (also specify preference order).
3. The course staff will assign the projects while considering the student preferences, and the approved topics will be replied back to the students. Please send your preferences until June 27, as the project assignments will start on June 28th.

Project Parts

Part 1: Presentation

Prepare a presentation of 20-25 minutes that will be presented in front of the class.

You should mainly rely on the lectures and tutorials, while extending them according to the specific project definition.

The following textbooks are recommended for further reading, however, note that these books do not replace nor closely represent the material from class:

*Fundamentals of Digital Image Processing*
Author: Jain A.K.
Published by: Prentice-Hall, 1989

*Digital Image Processing*
Author: Gonzalez R.C., Woods R.E.
Published by: Addison-Wesley, 2002
An **Example of presentation structure:**

1. Introduction to the topic/problem and motivation.
3. Mathematical development of the solution. You can start by shortly reviewing material taught in class and then extending it according to your project. Add explanations from engineering or intuitive perspectives.
4. Demonstration (i.e., presenting your Matlab demo).
5. Conclusion.

Please pay attention to:

- Use the regular notations and definitions from the lectures/tutorials.
- Give simple and clear explanations.

**Part 2: Matlab Demo**

Implement demonstrations in Matlab.

You can combine several demonstrations for the different parts of your project.

The Matlab code is required to be well written, i.e., pay attention to:

- Readable and simple code.
- Indentation.
- Section your code into functions.
- Documentation.

Prepare a detailed user guide with usage examples.

The code will also be submitted.

You are not allowed to use Matlab functions that supply the main components of your project. For example, you cannot use Wiener or Median filters as provided in Matlab.

**Part 3: Exam Question**

Write an exam question that directly relates to your project topic.

Provide also a solution.

The question should be mathematical and related to our course perspective of the topic.

Note that this part is highly important, as it reflects your understanding of the course material, thus, it significantly affects the project grade.
Part 4: Project Report

Submit a detailed report that thoroughly describes your project. The report structure may be similar to the above exemplary presentation structure, however extend the discussion beyond the content of your presentation slides.

The report should be of at least 10 pages.

Project Evaluation and Grading

The total project grade is 70% of the final course grade.

The project grade is determined as follows:

<table>
<thead>
<tr>
<th>Project Part</th>
<th>Details</th>
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<tbody>
<tr>
<td>Presentation (30%)</td>
<td>1. Mastering the material from class.</td>
</tr>
<tr>
<td></td>
<td>2. Showing full understanding of the extensions in your project.</td>
</tr>
<tr>
<td>Matlab Demo (30%)</td>
<td>1. The correctness of the demo (code and results).</td>
</tr>
<tr>
<td></td>
<td>2. The quality of the demo software as explained above.</td>
</tr>
<tr>
<td>Exam question (15%)</td>
<td>The quality of the suggested question and the correctness of the solution.</td>
</tr>
<tr>
<td>Project Report (15%)</td>
<td>1. Mastering the material from class.</td>
</tr>
<tr>
<td></td>
<td>2. Showing full understanding of the extensions in your project.</td>
</tr>
<tr>
<td>Miscellaneous (10%)</td>
<td>1. Independent work.</td>
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<td></td>
<td>2. Originality.</td>
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