Assignment: Final Project

Assignment Overview

The final project is an ideal platform to show your comprehension of the course topics, and your capability in problem formulation, creative thinking, hands-on implementation, academic writing and presentation, and team working. You are highly encouraged to form a team with up to three members. You are also allowed to work by yourself, but this is not encouraged as the work load might be too heavy.

Any topic related to audio signal processing is encouraged. Some possible topics are listed in the last section of the document. You are highly encouraged to propose your own idea. The scale of the project should be significantly larger than the homework problems. You are expected to go through the entire research cycle of the project, including problem formulation, literature review, algorithm implementation, testing, paper writing, and presentation.

How You Will Be Graded

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<th>Points</th>
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<tbody>
<tr>
<td>Project proposal</td>
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<tr>
<td>Project status report</td>
<td>5</td>
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<tr>
<td>Project presentation/demo</td>
<td>10</td>
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<td>Project final report</td>
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<td><strong>Total</strong></td>
<td><strong>30</strong></td>
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What and How to Hand It In

For each of the following documents, each team just need to submit one copy. All students in the team will receive the same grade.

- **Project proposal**: a 1- or 2-page document describing what you want to do, why you want to do it, and how you plan to do it for the project. A tentative week-by-week plan should be included. If it’s a team project, a tentative task allocation plan should be included in the week-by-week plan. As time goes on, it’s ok to deviate from your original plan and even the topic. But having a plan is better than not having a plan. Submit it via Blackboard. This assignment will be evaluated based on how well the problem is formulated and how clear your description is.

- **Project status report**: a 3-page document describing what you have done so far, what results you have achieved, and what needs to be done. If it’s a team project, you should describe clearly who has done what. Apparently this document should also introduce the project in the beginning. Submit via Blackboard. Include all the code and other documents you have composed in the submission. This assignment will be evaluated based on the amount and quality of work you have done and the clarity of the report.

- **Poster Presentation/Demo**: A PDF poster (say 36”*48”) illustrating your project, and any demo files you want to show during the poster session. Submit it together with the final report via Blackboard after the poster session. TAs and I will evaluate your poster/demo presentation during the poster session. We will evaluate it based on the amount and quality of your work and the clarity of your presentation.

- **Project final report**: A final report describing your project. Your report should be organized as a research paper, with abstract, introduction, method, conclusions, and
references. Use the ICASSP 2017 template to write your report. Latex and Word templates can be downloaded at https://www2.securecms.com/ICASSP2017/Papers/PaperKit.html. The main text should not exceed 4 pages but the reference section itself could be on the 5th page. Submit it via Blackboard. You should include all the code and example audio files in the submission. This assignment will be evaluated based on the amount and quality of your work, the novelty of the project, and the clarity of the report.

When to Hand It In

All documents are due immediately at the beginning (i.e., 0:00AM) of the date specified on the course calendar. Late assignments will not be graded.

Possible Projects

You can find projects that students did from previous years on the course website. Here are some additional ideas. Some projects only involve audio analysis, and some only involve audio synthesis, while others involve both.

1. Pitch detection of speech or music
2. A real-time beat tracking system
3. Chord recognition of music
4. Investigating timbre differences between singing and speaking voices
5. Real-time speech timbre change
6. Real-time 3D audio effect
7. Controlling audio effects with hand claps
8. Stage lighting control based on audio content