EECS 352 Group Final Project

Choose your own project

This is an opportunity for you to explore an interesting music/sound/audio problem. Example projects might be building something that generates music notation from an audio recording, an automatic instrument recognizer, a music-based computer game…or something else.

OK to use existing code

There are no restrictions on programming language, software or tools. Use of existing datasets and software packages is fine. You MUST, however, make it clear what your group is adding and contributing. You can't just take an existing open source project and hand it in as your own.

Group Assignment

For this assignment, you may form groups of 3 (strongly preferred) No solo projects are allowed. No groups of 4 will be allowed. A **small** number of groups of 2 will be **considered** if we don't have divisible-by-three number of students in the class. If you pick a group of 2, you might just get a 3rd person added by us. So think about that. The entire group shares a grade.

Deliverables & Point Values

- Project proposal: 5 points
- Week 8 Project Meeting & Report: 5 points
- Week 9 Project Meeting & Report: 5 points
- Week 10 Project Meeting & Report: 5 points
- Final poster/demo 5
- Final presentation 5
- Final website 5
- TOTAL: 35 points

Meetings With Group Advisor

You will meet **as a group** with your group advisor (the professor or a TA) on 3 dates. You are **all** expected to be **on time**. Being late or having a group member not show up, will cost points. You will give a short verbal report on the progress your group is making. Your grade will depend on your ability to clearly and briefly describe the high-level approach (your task, the approach, how you are measuring success, etc), as well as your ability to answer concrete questions on your progress. This is also a chance to get feedback, so use it as such.

Project Proposal

You must turn in a project proposal (between 500 and 1000 words)

The submission must be saved as an ADOBE ACROBAT PDF FILE.

Your submission must clearly and directly answer the boldfaced questions below.

The easiest way to do this is to copy each question down in your submission and then answer it in your own document.

- **What is the Project title?**
- **Who is in the group?**
- **Give a high-level description of what you want to do.** (a couple of sentences)

  Are you solving a problem? Duplicating a system you think is cool? Running an experiment?
- **Explain why this is this an interesting/useful/cool thing to do.** (a paragraph)

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- **What prior art is there? Give citations.** (a paragraph or two)

  Is there a commercial product that does something like this? Describe it and give links?

  Include a minimum of 4 relevant research papers.

  I want full bibliographic information.....AND hyperlinks to papers.

  READ them before submitting the proposal.

  Try *scholar.google.com* as a starting point.

- **What is the EXACT TASK that your system will do?** (a paragraph or two)

  Described the exact user interaction you expect….

  e.g. (like this, but in more detail)….*We will take a .wav file as input. The user specifies the the file on the command line. The file is assumed to contain audio from a musical instrument playing one note at a time. The software will pitch track the music, segment into notes, beat track and then output a .pdf file with music notation.*

- **What measure will you will use to evaluate performance of what you build?**

  Be specific. Don't say just "We'll measure performance."

  e.g. Our ground-truth is the actual music notation for a Bach chorale. We will score the result as follows….X points for getting the key signature right, Y points for getting the time signature right, Z points for every not that appears in the correct place, -Q for every missing note, -R for every extra inserted note.

- **Is there a data set that your system can be tried on? If so, what is it (give links). If not, explain why not**

  Where will you get it? Do you have to label it yourself or is it already labeled?

  How big is it? How many examples? How is it encoded?

  e.g. We will use the Bach10 dataset of recorded music available on Prof. Pardo's lab website:music.cs.northwestern.edu. This contains recordings of single-note instruments playing Bach chorales. It is stored as .wav files. There are 10 Chorales, each with 4 individually recorded parts. We can easily get the music notation off the web to know what the true notation looks like. We downloaded the chorale notation from here….

- **What is the baseline approach you will compare your system to?** Random performance? An existing system? Human performance? Be specific.

  The baseline approach we will compare to is to hand it to an existing music transcription system called (NAME). We will score NAME's output the exact same way we score our own. We will average the values over all 40 individual melodies in the Bach10 data set and report the difference in averages

- **Describe any existing software packages you will use.**

  Where will you get them? Give links.

  Have you already tried them out? If not, why not? If so, how did that go?

- **Describe any software will you need to write.**

  Are you plugging two existing projects together? Does that mean writing a wrapper

- **What are potential obstacles to success?**

  Do you need to learn a new language?

  Is there some data you don't know how to collect?

  Something else

- **How will you QUICKLY determine if these obstacles will stop you?**

  Describe a CONCRETE way of finding out if these obstacles will make it impossible to complete your plan in the next month. You want to know early, so you can change your plan.

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- **What other tasks (besides coding) will you need to do?**

  Data collection?

  User survey?

  What do you have to learn/know/get before you can start these tasks?

- **Milestones**

  What will you complete by the date of the first meeting with a TA/Professor report?

  What will you complete by the date of the second meeting with a TA/Professor report?

  What will you complete by the final presentation?

  Who is responsible for each milestone?

  e.g. The table below outlines our milestone, who is responsible for each milestone, and expected completion dates….

Project Website

You are to build a website that gives an overview of your research project.

You are free to format the website as you see fit.

You are free to host the website wherever you like.

That said, there will be certain required elements that we will look for. The website **must** contain the following:

1. The project title (prominently displayed)
2. The name of each project member (prominently displayed)
3. At least one contact email address (prominently displayed)
4. The name of the course, university and professor
5. A 3-4 paragraph synopsis of what this work is "about"
   - Motivate the problem: (what is the thing you're trying to do and why anyone should care
   - Describe what you're doing in very high level terms
   - Describe how you built/ tested (what your dataset was, how you measured success)
   - Describe some results (how well it works in no more than a paragraph)
6. A minimum of one pretty picture or graph that illustrates your work…with a caption and to explain what the viewer is looking at.
7. If at all possible….AUDIO EXAMPLE(S).

Note, these are minimal requirements. Having all these features guarantees an OK grade, not an A. Doing a good job with these things guarantees a good grade.

Note also, the plan is to make a unified final project website that contains links to all class projects. This website will be reachable from the class website and I will email the URL to the class mailing list so that you can all see each other's projects.

Final Poster/Demo/Website

The final exam for the class is a poster/demo session. Each group will bring a poster outlining their project. Those groups for whom a demo might be appropriate are welcome to provide a demonstration. **All members of the group must attend the poster session.** Grading will be based on the work, the effectiveness of the presentation, the poster and (where applicable) the demonstration. By the demo session, the website should also be finalized and will be part of the grading. **Items 1 through 6 from the "Project Website" requirements are ALSO required for the poster….although item 5 does not necessarily have to be in paragraph form.** You are free (and expected) to share content (images, text) between the poster and website.