

CSC 2417 Algorithms for Genomics
Project Handout

Don't Panic

In lieu of a final exam, the class will have a term project. For the project you are strongly encouraged (but not required) to team up with one other person. Groups of three people will be allowed in rare circumstance if there is a very good reason to have them. The topic for the project is defined as “anything at the intersection of Computation and Biology”. You are welcome to work on anything within this broad area, including applying known algorithms to different biological or medical data sets, developing novel methods for a specific problem, or building user interface techniques that you think would be useful for clinicians. One requirement is that your project, while not necessarily ground-breaking or publishable, should address areas that are of current interest to people in the field (see “Proposal” section for how to demonstrate this). You are strongly encouraged to speak with me about your ideas about topics.

There will be three deliverables for your project: an initial project proposal, and once your work is done a presentation before the class and a final write-up of your results. For the written parts only one writeup is expected from each group. Each of the three deliverables is equally important to having a successful project, however the official grade distribution is 30% proposal, 70% report.

Project proposal (due February 27th)

In the proposal you should outline what research you intend to undertake. You should summarize existing work on both the problem you are planning to solve and the method you plan to use – for example you may say “Problem A is important in medicine and has been attacked using computational techniques X and Y. Method Z is a complicated algorithmic (or machine learning, or database) technique that has been successfully used for problems B and C. However no one has applied Method Z to problem A, and we think it will do better than X and Y because it models the parameters of problem A more accurately.” You should be explicit about how you plan to test your method, whether it is using real or simulated data, and mention any gold-standard datasets that currently exist for your problem. You are also welcome to speculate why no one has applied method Z to problem A. To demonstrate that the problem and/or methodology you are working on is of current interest you are expected to cite and discuss at least two, and if possible more papers related to your work that have been published in 2007 or later. While there is no hard length requirement for the proposal, you should make it as short as possible while still giving a through background to both the problem and methodology and an explanation of how you plan to apply one to the other. The expected length of the proposal is on the order of 5 pages.

Final report (due end of April; exact date TBA)

While the work you do may not be publishable (you are not expected to improve on any current results – though if you do this would be great), the final report should in its manner of presentation resemble a paper ready to be submitted to a conference or a journal. You should introduce both the problem and techniques, demonstrate your results, compare your results to previously known ones, and possibly suggest some future directions for research. Regardless if your algorithm did or did not do as well as you expected you should speculate why it achieved the results it did. The exact length is again open-ended, but should be adequate to describe problem, results, etc.

Advice

Once you have some ideas about projects I strongly suggest you talk with me about them by scheduling an appointment. Do not leave this till the last second, as you may find me impossible to find. I also strongly encourage you to talk with other students both about potential topics and any problems you encounter while solving them. Think of the class as a large research group – people working on different, but related problems who can give each other useful advice. Finally we have a class newsgroup. You are more than welcome to post any concerns there and also to respond to other people's messages.