CS88/188, Web-powered computer vision, Fall 2009
Term Project

October 7, 2009

1 Important Dates

- October 15, 2009: project approval due

- October 20, 2009: project proposal due

- November 10, 2009: milestone presentation

- December 1, 2009: final write-up due

2 General Guidelines

The goal of the term project is to allow you to explore in some depth a topic of interest within the area of Web-powered computer vision. The project can be done individually or in pairs. A group project should have roughly twice the contribution of an individual project. There are two main types of project you can do:

- **Application project**: in this type of project you apply an existing computer vision algorithm to either browse, search, visualize, or organize large collections of images/videos in a novel way. The main contribution of this project should be a new tool or application addressing the limitations of current text-based interfaces to retrieve and navigate imagery data. Be careful not to pick a task that is way too hard. Furthermore, make sure that you can obtain data to evaluate your application. Once you have defined the task, research the computer vision literature in order to find a suitable method to solve the chosen problem. If you are unsure about the technique to use, come and talk to me.

- **Algorithm project**: in this type of project you propose and evaluate a novel variant of an existing algorithm that leverages large collections of images/videos to solve a challenging computer vision problem, such as object categorization, photo geo-localization, or 3D shape reconstruction. A good starting point for this kind of project is the set of papers that have been assigned to you: review them thoroughly, identify some shortcomings and propose a strategy to overcome these limitations. Your work will be graded primarily on the basis of how well you motivate your proposed solution: run experiments illustrating the shortcomings of the existing method and suggesting the benefits of your proposed modification. You won't

be penalized if your proposed method does not yield the results that you expected as long as you analyze and describe clearly the reasons of the failure.

You are allowed to use external software for *parts* of your work. The project grade will be based on the novelty of your solution/application but also on the amount of new code written by you to implement the idea. Thus, using code written entirely by someone else would not be acceptable. If you use external software, please report clearly which code is your own and which one was taken from external sources.

You can either define your own project or you can talk to me and I'll be happy to suggest some project ideas.

The topic of your project is subject to my approval: please schedule a meeting to discuss your project proposal with me by October 15th.

3   Project components

The project involves three distinct components: proposal, milestone, and final.

- **Proposal**: the proposal is a written document describing your intended work. This document should address the following questions:

  1. What problem do you want to solve? Describe at a high level the application and the computer vision problem involved.

  2. What are suitable methods for this problem? Research the computer vision literature and find a set of techniques that may be applied to solve this task. Include references to these methods in your proposal.

  3. What data sets do you plan to use? Include pointers to image/video databases that you will use in your project.

  4. What do you expect to accomplish by the milestone due date?

  Note that items 2. and 3. above are not binding: if after submitting the proposal you find new algorithms or databases that are more suitable to your task, you are free to use them without penalty. However, I want to see from your proposal that you have thought carefully about what you want to accomplish and how to do it.

  Proposal presentation: the same day when the proposal is due, you will give a brief presentation of your project proposal. You will have a few minutes to present a couple of slides describing your project plan. Make sure to discuss the four points above during your presentation. Upload your project proposal slides to Blackboard by October 19th (the day before the proposal due date).
  Proposal write-up and presentation will count equally, and contribute in total to 15% of your project grade.

- **Milestone presentation**: on November 10th you will present an overview of what you have accomplished up to this date. By this time you should have finished implementing most of the code. Furthermore you should have already some preliminary results or at least some intermediate output to show. The milestone presentation has two purposes. The first is

to encourage you to start working early toward your project goals: it is crucial that you make good progress soon in order to complete a successful project. The second is to obtain feedback from me and your classmates about your project. You should view this as a collective brainstorming session that may help you resolve issues that have impeded the progress of your project. For this purpose, please prepare a few slides describing in detail what you have implemented, the experiments that you have run, what has worked and what has not. Discuss also what you still need to do in order to complete the project. Finally, you should comment honestly on whether you are on-track and if you have reached the milestone goals that you had set in the proposal.

The milestone presentation will count for 25% of your project grade.

- **Final**: the final write-up is a document describing your project and the results you have obtained in a conference paper style. Your submission should include an introduction section to motivate your problem and algorithm, a section describing your approach and how it compares to previous work, a section outlining the experiments you ran and the results you obtained, and a short conclusions section to sum up what you discovered. You should write your paper for a technical audience. Therefore, do not write lengthy descriptions of basic methods. However, you do need to cite the articles related to all the algorithms that you have implemented. Furthermore, if you have made modifications to the methods, please discuss your variations in detail and provide a justification for them. The most important part of the final project report is the discussion of the results: include a thorough description of your experiments and use well captioned figures and plots to summarize your results.

  Final presentation: the same day when the write-up is due, you will give a slide presentation of your project. You will have about 10 minutes to provide an overview of your work and to illustrate the results that you have obtained.

  Final write-up and presentation will count equally and, together, they will be worth 60% of your project grade.

I am looking forward to seeing your project. Have fun and good luck!