

CSC285/485: Algorithms and Elections

Information Handout/Syllabus

Spring 2015

Version 1.2.1

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(the most recent revision of this document can always be found on the course web site)

Location/Time: The course meets in Room CSB 632, M/W 4:50PM–6:05PM.

Instructor: Lane A. Hemaspaandra, CSB 618, cs285 “at” cs.rochester.edu. Office Hours: Wednesdays, CSB 618, 320pm-420pm (but please always feel free to stop by any time without an appointment or, easiest of all, grab me right before or after one of our class sessions).

TA: Rupam Acharyya, CSB 727A (it is a bit of an adventure to find; during the business day one can perhaps get there most easily—without having to knock on locked doors that is—by walking through the 7th-floor mailroom and then turning left and going to the room one can see through the glass), cs285 “at” cs.rochester.edu. *Office Hours* (all in CSB 727A):

From start of term through Feb. 20th Mondays 605pm-705pm; Tuesdays 200pm-300pm; Wednesdays 605pm-705pm, Thursdays none; Fridays: 200pm-300pm. (But please always feel free to stop by any time without an appointment in case he is free, or to make an appointment with him via email to see him at some mutually convenient time.)

From February 24 through the last day of classes To give you more flexibility in seeing him when it fits your schedules—both regarding seeing him for general help and regarding making appointments for your group to do the 3 (or 4) runthroughs that it will do with Rupam of your 3 (or 4) talks, instead of having fixed office hours for this suffix of the term, we’ll take the following approach. Please simply by email or in person or by email make an appointment to see him whenever you want to see him. Do not be at all shy about doing so, he is devoted to the material and enjoys helping you master it (as do I); the shift from fixed office hours is meant to increase your degree of flexible access to him, not to decrease it. (And please always feel free to stop by any time to see him without an appointment in case he is free, or to if he is there but is swamped then to make an appointment with him to see him at some mutually convenient time.)

Note: Like most CS people, the TA and I prefer email to phones. By the way, as to “cs285” being listed for both our email addresses: Please do make sure to use only the “cs285” address—and not the TA’s or my one-person email addresses—for email regarding the course. That will help all the course staff—i.e., both Rupam and me—be on top of everything that happens. If for some exceptional reason you do need to contact a particular one of us directly and individually, you can find our one-person email addresses by looking at the pages you get to by clicking on our names on the course home page.

Prerequisites: To take this course, you must have taken *at least one* of the following courses: MTH 150, MTH 143, MTH162, MTH172, PSC107, CSC280, CSC 281, CSC 282. (But don’t worry if you for example have taken only one of them. The requirement is that you must have taken at least one. And don’t worry: People will have widely varying areas and backgrounds. So in the course’s first weeks, we will cover both the algorithms basics and the elections basics.)

Course Goal/Description/Mechanics: This course's topic will be algorithms and elections, especially how to use algorithms to attack (i.e., seek a given outcome from) elections and how to use complexity to protect elections from manipulative attacks. We will cover roughly around twenty research papers in this area—generally, one per class except during the first weeks when we are covering the basics. Among the key computationally interesting problems regarding election systems are the following four central problems: the winner problem; bribery; control; and manipulation. So we will likely see quite a bit about those problems. But we probably also will touch upon other issues, which potentially might include some of the following: heuristics; range restrictions such as single-peakedness; approximations; possible and necessary winners; and various issues regarding preferences, preference representation, and preference elicitation. The reason I say “potentially” is because the students in the course will in a very important way help shape what material is covered, as will be made clear in the following paragraph.

The course will work as follows. I will myself present the first few weeks of class sessions. The first class session will be a very informal discussion of the flavor of the course and a very informal discussion of the three key attack types. The second class session will review in detail the course information document/syllabus. The next 2-3 weeks after that will be lectures by me, going over basics first and then as time allows presenting the material of papers. But after that, the sessions will be presentations, by the class's members, of literature papers. These will be organized as follows. A “unit” will be a series of N lectures (the value of N will depend on the size of the class, and different groups might have slightly different values of N depending on the particular material assigned to them), with as its focus a towering researcher on algorithms and elections. The group that is assigned to present the unit will give N lectures on papers written by that person (depending on the class size, the lectures in a unit might or might not be consecutive; I'm hoping the class size will be such that I can schedule things so each unit gives all its lectures consecutively). (Note: Most natural will be for each group to speak on N papers, one per lecture; but if you wish and I don't ask you to cover N specific papers, your group can speak on $N - 1$ papers, distributed over your N class sessions. But in general, the best approach is to cover one paper per lecture.) In some cases, I'll when assigning your focus person also specify some or all of the papers for you to cover (for example, for the “Sandholm” unit, there are (at least) three very important papers to cover, and so that one will probably be fully specified by me), but in many cases, you yourselves will choose some (or perhaps in rare cases all) of which papers by that focus person to present. The papers of course should be on the topic of algorithms and elections (note: we use the term algorithms broadly, to fully include both p-time algorithms and complexity results such as NP-hardness that suggest the nonexistence of p-time algorithms; as to elections, we'll not interpret that tremendously broadly, but rather it really means things that are directly about elections, except also issues of preferences/preference representations/preference elicitation we'll consider fair game since those issues are so important to elections; additional note: you should not speak on a paper that some earlier group has already spoken on, even if your focus person is an author of it). However, though your papers will all be by the focus researcher, you are free (give or take whichever papers by him or her I ask you to make sure to cover) either to choose related papers by that researcher or to cover quite differing papers by that researcher; in fact, most fun might be to do the latter—these most of our focus researchers are quite broad, and you can thus present N or $N - 1$ of your researcher's very best papers (but, of course, always just those within the focus on algorithms and elections).

The group members do not have to split each lecture equally between them, but each group member should do a substantial amount of lecturing during the group's overall unit.

I'll assign the groups and the focus person for each group. The size of the groups (which might

even vary from one unit to the next) and the number of groups each person will be in during the term (most likely 1 or 2) will depend on the number of people in the class. (My off-hand guess, at least with the class size as it is as I write this, though all this depends heavily on how many people take the course when the class size settles and other things so any or all of these numbers might change even if the class size does not change, is that the typical group size might be 3 or 4, and that each person might be even just be in 1 group this year, and that most groups will have N set to a number quite near 4. I'll try to make sure that no two people in the class differ by more than 1 regarding the number of groups they are in, and will lean toward students-taking-it-as-485-rather-than-285 or volunteers as to who will end up doing the one-more if some do one-more; and it is quite possible that things will work out so that everyone will be in the exact same number of groups. The TA may well himself give a unit, most likely as a group of size 1.)

Logistically, the block of class sessions starting with the 3rd class (these will all be presented by me) will give you a sense of what is expected in a unit/presentation—especially in any lectures I give beyond the coverage of basics, that is, especially in any that are directly on some research paper. (But even my lectures that are directly on a research paper will differ from the other units in a few ways, for example, your units will be about towering researchers' work and mine will just be about some of my work; you should make your slides yourselves and for my talks in some cases I may use slides prepared by my coauthors; nonetheless, my talks should give you a sense of what a unit can look like). In particular, your presentation should be done with nice slides (namely, PowerPoint or pdf) made by your group, projected using the 3-color projector from your laptop. During your group's N or $N - 1$ lectures your group will present the (N or $N - 1$) papers by the focus researcher. Immediately after each lecture (to be specific, this *must* occur after class but also by at latest 8PM of the day of your lecture, or your group's grade for the unit will be lowered), you will mail to the entire class an email that gives (1) a bibliographic reference to the paper that you covered (e.g., "Why P equals NP ," by Dr. Seuss, Journal of Irreproducible Results, Volume 121, number 3, pages 4-143, January 2015; if the paper itself is available on the web, you might want to also provide a URL for where the paper is, though journal papers can almost always be gotten by any one of us by using our the UR library system's "eJournals" service) (2) a URL pointing to a file that is the slides that your group presented (namely, as .ppt/.pptx/etc. if they are PowerPoint slides and as .pdf if they are pdf slides). Do this by sending a very short such email to the class "public" mailing list address, which is the username 4CSC285_75314-L in the domain "lists.rochester.edu" (email sent there will go right to everyone who is subscribed to that "mailman" list; you should each **immediately** add yourselves to that list, unless the registrar already put you on it based on your registration). Please be aware that the setting of the mailing list will itself probably bounce/block emails that are too long, and various internal or external mail servers could impose even tighter constraints; thus, to avoid the headaches and confusion of some people not getting large emails (and slides often create huge files, e.g., due to pictures or scans), note that your email should **not** send the slides, but rather should send a URL that is the slides at a web location where you have put the slides. (Note: You should NOT change the file at that location after you have sent out your email!) If a given class is for example about the same paper as the previous class and if the current class used slides that already were distributed by your group associated with the previous class session, you nonetheless should definitely send an email by 8PM, mentioning again the paper and the URL, but also mentioning that one or both are the same as you sent around associated with the previous class. (Simply put, if you speak on day N , you should send an email out after class ends but before 8PM. Oh... that "you" doesn't apply to *me* when I speak, but as a practical matter, I'll often do that exact same thing, although in my case I may break the above rule about sending the

email *after* class and may instead send my email around before the class, depending on the exact nature of what I'll be teaching and what slides I'll be using.)

Each group (except any group that contains the TA, if the TA is made part of one of the groups) *must* do a runthrough of each of its talks to the TA (who will give immediate suggestions/feedback if he has any). That runthrough must occur before you give the talk in class (so your group should make appointments with the TA long in advance for these runthroughs, e.g., you might want to—long in advance—schedule each with him for a day or two before your class giving of that talk, so that you have time to revise your slides/presentation after he gives your group his suggestions, if any, at your runthroughs). There will be BB columns for each of your talks, in which he'll give each group member a Y if that runthrough occurred before the in-class talk, and a dreaded N otherwise. (If a talk is runthrough with the TA, all group members get a Y regarding that runthrough column, even if due to schedules some could not attend the runthrough; but do try hard to have every group member attend each runthrough if at all possible, and of course scheduling the runthroughs long in advance will help you make that happen!)

Regarding future offerings of this course, your slides might be very helpful if you'd allow them to be used for that. So by default, turning in your slides is implicit permission to use them (of course making clear the fact that you created them; by the way, the names of all your group members should absolutely always be mentioned always on the very first slide of your presentations, probably right below the title, authors, and bibliographic information on the paper the presentation is on; the natural way to do this is by a line of the form "Slides/Presentation by [your names]") in future course offerings; if you wish to not have a particular set of your slides open to being used that way that is totally fine, and please to signify that in that same transfer email just include the line "please do not use these slides in any future course offerings" (including that line in no way impacts your grade; it just ensures that if I or someone else ever comes back to that email while working on a future course, we'll know to be hands-off on that set of slides). (Related tidbit: Although ppt/pptx/etc. versions in effect pretty much are source, pdfs are not, so for groups that hand things in as pdf, I ask them to please, if they're willing to potentially have their slides used in future course development, send in also, as a zip archive, whatever the "source" was, e.g., L^AT_EX/Beamer code; to do that, *do* in a separate email send the actual source code, to "cs285" in the domain "cs.rochester.edu"; this will be a separate email from the one you send to the class mailing list (4CSC285.75314-L) that you use to let the class know of the URL where the slides (as ppt/etc. or pdf) are available.)

Note that at the end of each unit, I or the TA and I will assign a letter grade to the group for the unit (we may do this in person immediately after class on your *N*th lecture day, meeting with you right after you dismiss the rest of the class). *All members of the group get the same grade for their joint unit; you are working as a team, and so should each help each other make every aspect of the unit as well-done as possible, as you all are responsible jointly for all of it, and will be graded jointly.* (If someone in your group does not pull his or her weight—***trust me: sooner or later it may happen... in faculty/academic/industrial research it certainly does happen more than one would hope***—you or a groupmate will need to cover for him or her, since you all get the same grade. Consider it a valuable learning experience of a painful truth.

Each presentation should be timed so that it *and whatever questioning happens during or after the talk* will fill or mostly fill (but will definitely fit within) the 75-minute class. Keep in mind that each student not in the group giving the talk *must* ask a question at least twice during your unit; so do leave time for that. For most groups, it will be natural to time your talks so that without any questions or interruptions the talks take 50-60 minutes (certainly not more than 60 minutes); that

will allow 15-25 minutes for answering questions during and after the talk.

Preparing/giving your presentations is the largest part of your coursework (and also, see below, is most of your course grade). Your group should do that preparation completely yourselves—this is a central part of the course experience (and is not an easy thing, but it will get easier as your unit goes on and you get more experienced at it); you should not seek help from any live person (no asking people for help, not even me, and no posting questions to the internet or to the class mailing list, etc.; the one slight loophole here is it is ok to seek advice from the TA, especially if you have having problems, though you should not try to have him write your slides for you, of course) and you should not lift slides from the web site of authors of the paper (or anyone else) even if they have up slides. However, you certainly can look at such slides sets if they exist on the web (they usually don't but sometimes do), but your slides should be your own take on the work; also, it of course is fine to read lots of papers/etc. while preparing your talk—the library and the internet are great resources. After a talk is prepared, you will want to do what experienced people do: Give it, in private, to an empty room or to your group, to fine-tune it. For example, at the Dagstuhl workshop I was last at, the night before my talk, I was in the lecture hall, giving in full, to an empty room, my talk.

By the way, the flavor of each talk is largely up to the group. Among the things each group may cover are such things as positioning of the paper and its relation to the literature, the models of the paper, the proofs/proof techniques of the paper, the results of the paper, and the open issues presented in or created by the paper. Most talks will of course cover various of those things, with stresses set to the group's taste. My only caution to you is this: Slides filled with technical proof details almost never are followed by audiences, and so to spend a talk all purely in technical proof presentations is almost impossible to pull off well; usually it is far better to just try to convey the core idea fueling the paper's proofs, or to give examples showing whatever is creative in the proof technique, or to give proofs but to keep them clear and accessible and not to let them take up so much of your presentation that people lose site of what is being proved or why it is important. For some papers, you may well choose not to give any proofs at all, but rather just to mention the flavor or idea behind the proofs and refer interested people to the source paper for the details. Let me also mention that it is particularly important for you to, as you present papers (my unit will be a bit of an exception as I'll after the lectures covering basics be presenting my own work, and to do this there wouldn't make as much sense as one is always biased about one's own work), say what you found particularly strong in the paper and what you found particularly weak, and, relatedly, so very important as to be something you should make explicit at the start and end of each talk is to crystallize into a sentence or two the core contribution of a paper. (For example, "This paper's core contribution is to show that whether there are sparse sets in NP-P is completely determined by whether NE and E differ, and it shows this by a stunningly creative new encoding technique that spreads information about a set into log-sized strings that allow the set to be understood and recreated. The only possible weakness I see in the paper is that this is building on an earlier and analogous result regarding tally sets; but the advance from tally to sparse seems to me quite powerful and nontrivial." As another example, this one perhaps historically unsound, "In this paper, Alan Turing introduces a computing model that is very creative and shows that it in a certain sense is 'universal,' yet I'm just not sure this notion is well connected to actual real-world computing machines in terms of running times tightly enough to ever catch on or be further studied.")

Your presentations should definitely not assume that people have read the paper before seeing your presentation. (Of course, interested audience members might well be inspired by your talk to, after you send your by-8PM email, get and look at the paper! By the way, let me mention that UR

gives you online access to the content of a huge range of journal (and other) articles, and almost all of our focus authors have their articles easily available directly or indirectly from their web sites.) What we're loosely modeling here is the experience people have at conferences and workshops and department seminars (and to some extent, in a sort of strange way, undergraduate and graduate courses at most lectures!); at conferences and workshops, in fact, one within a few days has to process dozens of talks on papers one has never seen before, and through focusing on the content as it unfolds and through asking questions the audience must help ensure that the speaker doesn't lose them and that they get the most possible out of the talk. One important goal of this course is for you to improve your skill at focused, active, interactive listening/learning/participation during this type of talk and the question session at its end. (By the way, unless you are a member of the group giving the talk and are using your laptop to help control the slides/talk, you should not have your laptop or cellphone/smartphone open or in use during talks. If you have a documented disability relevant to this issue, please speak to me early in the course about this, as I of course will not apply this to you in that case. Also, as to audio or video recording of classes, the course rule is that audio and video recording is not allowed; exception: if you have a documented disability that affects the issue of recording of lectures, please see me.)

Grading (and More Mechanics, esp. Regarding Class Participation, Attendance, and the Project):

The overall course grades (A, A-, etc.) will not be any fixed curve, but rather will reflect the instructor's judgment about what grade is appropriate based on performance quality, i.e., based on the grades you get on the various components, weighted as described below. However, you will certainly not be given a course grade lower than your grade average as computed as described below and rounded to the nearest grade that exists for course grades for you for the course; (e.g., if your grade average is a 3.85 then you'll get at least an A, and if your grade average is 3.84 then you'll get at least a B+); be aware that the grad school and the Engineering school disallow certain grades. I realize that that might let some of you realize well before the end that you're on track to an A, but I certainly expect you to even if so keep giving the course your best (slacking at the end may result in a low second-half class participation grade, but I know you'll work hard not because of that grade effect but rather because you're dedicated to learning—which is why you are taking this!).

Your group's unit presentation grade will count for 55% of your grade. Your class participation/attendance grade will count for 15% of your grade. Your project (i.e., your individual "tenure-case or etc. recommendation letter") grade will count for 20% of your grade. The exam on foundations that we'll have, in class, during my prefix of the course, will count for 10% of your grade. See below for more details on these grades. Grades are by letter (except the exam, which will be graded directly on, or rescaled to in a way that it will specify clearly, a scale of 0.0 to 4.0—perhaps with extra credit available beyond 4.0 but more likely not—so it can be averaged in appropriately), and for doing the weighted averages, we'll use the following values for the grades: A=4.0; A-=3.7; B+=3.3; B=3; ...; E=0.0. (UR doesn't have an A+ grade, but if I give an A+ on something I'll average it as if it is a 4.3.)

Your group's unit presentation grade for a given unit will be given to you by me (possibly in consultation with the TA) at or shortly after the end of the unit; see above.

Your class participation/attendance grade will be the average of three grades: your class participation grade for the first half of the term, your class participation grade for the second half of the term, and your attendance grade for the term. The first of those will be given to you around the middle of the term and the second will be given to you during or shortly after the last one or two class sessions. You are *required* to pay close attention to each of the lectures not by your groups (and

also those by your group-mates), and to, within the N or $N - 1$ lectures regarding *each* class-given unit not by a group you are in, *ask at least two questions*. The question(s) you ask might be at the end or might be during the talk; each group will try to ensure that everyone gets a chance to ask questions at talks, but it is also up to each of you to do the asking. Now, at first I was thinking of trying to define or require the questions to be substantial to count. However, one person's substantial question might be someone else's dumb question, yet might be valuable to the person asking it and to others. Indeed, please don't hesitate to ask "dumb" questions during a talk; if you are confused about something, probably a few other people are too but are too shy to ask. However, if your question/comment is for example a joke that doesn't have any real substance, please make very sure to ask another question/comment during that unit that does have more interest/content to it (see below regarding the fact that asking just "what time is it?" each talk may get your count up to 2 for each unit but still would get you an E grade on participation). (For each unit, we will have a BlackBoard column that lists for each student a 0 or a 1 or a 2, which is the number of questions you have asked during that unit; except members of the unit's group will start at 2 since they don't have to ask questions. Your number must be 2 by the end of the unit.) You shouldn't ask questions just for the sake of asking a question (though sometimes you perhaps will have no choice but to do so you get up to 2, but if so, that is an unhappy case); rather, you should be alert during the talks, and ask questions about things in the model that lack clarity, or things in the talk that you don't follow, or about open directions, or etc.—ideally, the questions should be things you care about and are interested in hearing more about or things you would like clarified. By the way, I mostly wrote "question" above, but actually I always mean "question/comment," e.g., if you make a comment such as "aha... if what you say is true then you have proven that $P=NP$ " and you explain why, well, that is more interesting than most questions. In giving the letter grade for each half of the term's participation, I'll look carefully at the numerical 0/1/2 columns, but as just mentioned will also draw on what I have noticed about your contributions (for that half of the term, e.g., for your first-half grade, even though there will not be a 0/1/2 column for the prefix of the course's classes/lectures that I give, your participation during those will be weighed by me in computing your participation grade, so even during my prefix of the lectures you should make sure to ask at least one or two question—and, more generally, to participate and be involved). I hope everyone will get A's for their participation grades, and it could very well happen, but that isn't automatic, even if you ask questions at each talk; you need to seriously contribute to the questioning. For example, if at each talk your only question is, "What time is it?", you'd get an "E" (fail) on participation.

As to attendance, I expect you to attend every class session, unless of course you are ill. Logistically, though, that grade is completely mechanical: Your attendance grade starts as an A, and if you miss 0 or 1 or 2 classes remains an A, and for every class beyond two that you miss drops by a notch through the UG/G grades (whichever applies to the number you are taking the course under) at UR (so if you miss 3 classes during the term, your grade drops to an A- and if you miss 5 it drops to a B). Those 2 allowed misses are a bow to sicknesses, broken cars, and other compelling excuses, but are the only misses allowed; the only exceptions to this drop-2 rule will be in cases where you bring in an appropriate letter from a convincing Dean who in writing certifies that he or she has read and understands the course's policy that no quizzes beyond two are dropped and feels that your case is so extraordinary that there is a compelling case to not follow this fixed course policy in your case. Of course, if you are healthy all term, please miss not two classes but rather

miss zero classes.¹

As to what we'll call your "project," that is not a group project, but is an individual project. And here is the project. You will write a research evaluation of one of the focus people covered by one of your groups (you can choose which focus person to write on if you are in more than one group, but it is cheating to discuss your paper with anyone before the due date, and so if someone else is writing on the same person—and if you are in just one group and everyone else is too your whole group will be writing about your focus person, separately, for the project—it would be cheating to discuss it with that other person). So, basically, if the person is an assistant professor you'll be writing a tenure-case-like research evaluation letter, if the person is an associate professor you'll be writing a promotion-to-full-case-like research evaluation letter, and if the person is a full professor, you'll be writing a should-this-person-be-given-a-University-Professorship-like research evaluation letter (a University Professorship is a special distinguished level that some schools have; UR doesn't, though there are some named chairs; even if the person you're writing about is already a University Professor at his or her school, ignore that fact and write a letter as if the person currently were not one). Your letter should be a clear setting out of the strengths and weaknesses of the person's research. You'll probably want to mostly focus on the N or $N - 1$ papers your group covered, but you'll also probably want to look at some other papers by the person to get a fuller picture. Your evaluation letter *must* meet all the following format/size constraints: It must be 6–10 pages in LaTeX if you are taking the course as CSC285 (and must be 10 pages in LaTeX if you are taking the course as CSC485), using 11-point Computer Modern, using linespread factor 1.3 (that is, right after the documentclass line, include `"\linespread{1.3}"`; this will increase the interline spacing), with margins of 1.4–1.6 inches on all 4 sides (the page number itself doesn't count, that is, the space from the bottom of the page to the last text line of the page should be 1.4–1.6 inches, except perhaps on the final page; also, the top-of-page gap on the first page might be different if you use a "maketitle" or other header and that is fine). That might sound short, but evaluation letters need to convey their points succinctly enough that they are read by administrators and chairs and so on (and no, no, please don't make the same point about course information documents—anyway, the very fact that you are seeing this parenthetical proves that you did get to it, by hook or crook or perhaps because I'm reading through it out loud in class on the second day!). In writing your letter, do keep in mind that the hypothetical eyes that will see your evaluation letter are not specialists in algorithms and elections, but rather are a bunch of faculty members from all areas of the person's department, and also the department chair, the Dean, the Provost, and an outside "ad hoc" committee of faculty members every one of whom is *not* from the person's home department. So your letter must be readable by people who don't even know about CS stuff such as NP or Big-Oh or elections stuff such as what Lull elections are or what control-by-adding-voters is. And so in your letter, you will have to express the person's strengths and weaknesses, and the person's advances and their importance and value and what those advances even mean at all, in terms that are

¹One exception: religious holidays mentioned to me long in advance. To be explicit: You should, no later than January 23, noon, send me an email if any of the class days fall on days where due to observance of a religious holiday you will not be able to attend; in that email, you should please let me know all such days for the entire term. If you have a religious conflict told to me by the above date, I'll regarding the exam give you a makeup (perhaps oral or perhaps written) exam or will simply try to avoid having the exam on that day. And as to the attendance-grade calculation, I'd typically credit you as if you attended on that day even though you didn't, although please do read the slides for that class when/if they get posted and find from a classmate what was covered, and also it is your responsibility to check within the standard 48-hour window that I do properly mark in that attendance credit. If a hand-in/project falls due on a religious holiday, you should take that into account and make sure your group, or you if it is the individual project, knows to hand it in on or before the deadline.

clear to people who are smart but don't have any relevant background. And you'll have to do it in 6-10 pages. This is a truly demanding task, that is actually more difficult than writing for technical experts, and that actually is harder than writing a *longer* letter. (I know this all too well. As a faculty member, I often have to write external evaluation letters; it is way-hard!) Your project should be turned in by email, as a pdf document, no later than whichever comes later among (a) 11:59PM, Thursday, April 16th, 2015 and (b) 11:59PM two days after the last talk in the last unit whose group you are a part of (note: you of course will have mostly written the letter before that last talk, since you'll have already prepared/given the earlier talks). Please do plan ahead and start this early so you don't get caught in a last-minute rush. Email your project not to our course mailing list, but rather directly to "cs285" in the domain "cs.rochester.edu." (Just to be explicit about how lateness on this will affect your grade, turning it in by 11:59:59.999 on the appropriate day means there is no reduction due to lateness. And on the hour, each hour, starting at midnight sharp there is a 0.25 point deduction, on a 4-point scale. So for example if your paper is turned in at 1:00:00AM and your grade is a 4.0 (i.e., an A), the lateness will reduce your grade to a 3.5 (i.e., halfway between A and B). Submitting it right at midnight would lower a 4.0 to a 3.75. And if you submit it at 8:00:00AM, a 4.0 paper will get a 1.75, and if you submit it at 3:00:00PM, a 4.0 paper will get a 0.00 grade. (So, even before getting to being one day late, the grade already is driven down to a zero.) In short, since improving a paper by 0.25 points in an hour is not likely: You have every incentive to submit it on time, and submitting it late will drastically drop your grade. So please make sure to submit it safely on time. Finally, let me be clear about the issue of times—send time versus receive time and so on. I'll use (unless the entire header trace makes it clear that that one machine itself has a crazy clock, e.g., if the machines after it show much earlier times, in which case I'll use my own judgment after looking at the whole header trace) as the time the first time in the email hand-off trail, *excluding* any time value generated by your own machines. So if your laptop's clock or the clocks on other machines inside your controlled-by-you machine network/world is/are running slow, that won't give you extra time. And, after sending your email, don't put your laptop to sleep so quickly that the email doesn't get sent out at that time (on my Apple laptop, if I hit send on an email and shut the cover quickly, which puts the laptop to sleep, the email often doesn't go out until the next time I bring that laptop back to the world of the living, so this really can happen)—doing so might turn your paper from an A to a fail.)

There will be no quizzes but there will be the one exam that will count for 10% of your grade. It will come during or right after my prefix of the course, will be in-class, you will be allowed to bring in and use one 2-sided page of *handwritten (not computer-printed), self-prepared* notes if you wish. You may not use magnifying glasses/etc. The exam will be on the foundations of algorithms and elections, and in a class session I'll have reviewed the scope of the exam. The exam is not intended to be brutal, but rather is intended to reward you for having a good command of the basics of algorithms and elections as covered in my early-on lectures, and I do hope everyone will do excellently—it is quite possible that everyone or almost everyone will.

This course is available for audit credit, but only with my permission, so if you want to audit this course, please do make sure to talk with me (by email or on the first day of class).

As to grades (and what is made public and what is not), each student/group is given his/her/its grade on each item, and I of course assume you'll keep track of those grades (and I too will, of course), and at the end of the course he or she will receive his or her course grade either from the registrar or from me. However, I in general do not give out grade/distribution info beyond that, though of course if a student wishes to share with some classmate his or her grades on some items or the course, that is up to him or her.

Class Attendance: Required.

Academic Honesty: On all aspects of the course, it is very important to follow appropriate norms of academic honesty and professional conduct, most importantly including those regarding plagiarism; do not plagiarize. Please see the link from the course's main web page to the school's site on academic honesty.

Textbook/Library Reserves: There are no required texts. I have put on reserve at Carlson over a dozen books, mostly books or handbooks on algorithms, complexity, LaTeX, and voting. These might be useful to you, for example, if you want to look up some complexity class or something about algorithms or something about voting. Most are on 1-day reserve. (Note: As of when I'm writing this, the library hasn't yet processed my reserve request, but I trust they will very soon.)

Newsgroup: We will not use a course newsgroup or the discussion features of BlackBoard.

Blackboard and More Grade Logistics: We'll use BlackBoard for your grades on each of the items in the course. If we misrecord a grade, you must notify us within 48 hours, by emailing cs285 "at" cs.rochester.edu, with details of the misrecorded grade, to have any chance of having it changed. As to outright regrading, for most of the items in the course (e.g., things related to attendance/participation/my grade on your presentations) regrading isn't relevant, but regarding the two potential exceptions to that, the Exam and the individual project (i.e., tenure letter/etc.), the rule for regarding requests is as follows (for the exam, the time window starts with whichever comes later of when the exam was made available for return and when this clause was made part of the course information document, and this year, the latter is the later of the two): To request a regrade, you must within 48 weekday hours (hours during Saturday and Sunday don't count against the 48) of the date the piece of work was announced as available for return (typically, that means the class session where we give it back; that applies even if you didn't attend that class session; if you miss such a class session, you of course should arrange to get your item back almost immediately from the TA) email to cs285 at cs.rochester.edu a color scan (if you absolutely do not have a color scanner available, a black-and-white scan can be sent) of your entire work that you are asking to have regraded, along with also sending in your email as text or as a pdf your written argument as to why you think the grade given to you is incorrect. A TA or I, most likely I (so note the warning below!), will after looking the issue over get back to you, either by email or in person. (*Warning 1: I tend to be a far more meticulous, detailed, demanding grader than pretty much any TA. Warning 2: Note that when you request a regrade, the entire piece of work—not just the issue you are asking about—will be regraded, and your grade may move either up or down. For example, if I (or the TA) discover that the TA (or I) missed some errors, or just was overgenerous relative to the view of the grader (see my above comment about my grading relative to that of the TA), moving down is a real possibility.* These rules and deadlines will be strictly enforced. Of course, the TA and I are always happy to discuss with you, after an item is handed in, the (intellectual/technical) issues regarding the solutions of the project. But all grade adjustment requests, whether clerical or of substance, must be initiated within 48 weekday hours (so you can't at the end of the term, for example, seek to get a few more points added to your Exam).

Blackboard Announcements: Most day-to-day announcements, if any, will be transmitted using the Blackboard "Announcements" feature. You can see these announcements within Blackboard. By default, Blackboard will *not* send you these by email. But you can, by changing your settings in Blackboard, arrange for it to do so (although the UR Blackboard administrator warns you that that option is not necessarily reliable; and so you even if you have it turned on you should very

frequently peek at the course's Announcements area within Blackboard). *You definitely should do so; I assume that you have, and that you thus are quickly getting all late-breaking updates!*

So, how do you turn on email notification of Announcements? Here is how, thanks to the UR Blackboard Administrator:

In your main BlackBoard screen, click on the caret or "V" near your name in the upper-right, then choose Settings, then choose Edit Notification Settings. Fixing your general settings won't save you; the course ones override it in a bad way. So under Edit Individual Course Settings, select this course, and then check the Email box at the top of the email column, *and then make sure to click on Submit*. Again, though, be warned: Even the BB Administrator here warns that, to give her exact words, "Notifications are updated hourly. In the past, there have been issues with notification reliability. While Blackboard reports this fixed in the current version, please be sure to also check directly."

Fun with Numbers: Although the course is both CSC285 and CSC485, depending on which you are registered under, I'll often just refer to it by one or the other of the numbers (or sometimes as CSC285/485). Note also that although students taking 285 can submit a project as short as 6 pages, those taking the course as 485 are required to submit a 10-page project; also, those taking it as 485 will be leaned toward as to who has to do an extra unit if the numbers don't come out so that the load is uniform in terms of number of units.

Email: So, please note this carefully: mail sent to cs285 "at" cs.rochester.edu goes just to Rupam and me, and mail sent to 4CSC285.75314-L "at" lists.rochester.edu goes immediately to the entire class (including Rupam and me). Please do not send emails to the class list except for your "by 8PM the day of your talks" emails.

Web: The course web page is www.cs.rochester.edu/courses/285/spring2015/, and you can find the syllabus and some helpful links there, as well as a day-by-day listing of the main topic/paper of each class session that has happened so far.

A Final Comment: In this course, you'll be yourself mastering and presenting, and hearing others present, a large number of very important, cutting-edge research papers. You may find some things difficult to follow, and if a talk is hard to follow, raise your hand right away and ask the speaker whatever question is worrying you or about whatever you are not following; as I mentioned before, if you are confused, so too are probably many other more shy people. And don't feel bad if occasionally a talk is unusually hard to follow even after you ask questions; even professors sometimes—more often than they would like to admit—at workshops attend talks, even in their own area, and find the talks hard to fully follow. (Here is a cute, relevant anecdote from Moshe Vardi's introduction to the September 2011 issue of *CACM*, where he mentions asking, at a theoretical computer science conference, how many people understood at least $N\%$ of at least $N\%$ of the papers—to get 50% of the people to say yes, he had to drop N down to 50. Understanding talks is a nontrivial challenge!) Nonetheless, I suspect for most of the talks, it will be (thanks to your strong presentations!) easy to follow the core idea of what the paper did; so pay attention and participate, but above all, enjoy—almost all the papers you'll present did truly lovely things or opened/expanded exciting directions.