Good afternoon, everyone. This is the Graduate Fellowship and Scholarship information session.

My name is Colin Robertson. One of my roles with the department is to assist with student awards, scholarships, and fellowships. We are lucky to have a few panelists with us today. Professor Jeff Erickson is here, and we also have Ph.D. student and NSF and NDSEG Fellowship winner Tim Weninger. Unfortunately, something came up at the last minute and Professor Forsyth was not able to be here.

We are videotaping this session, so if you have to leave early, or if you have a friend who could not attend, you should be able to see everything later. I will also be posting the slides and my script online.

Before we get started, I am curious about the composition of the audience today. Can I get a show of hands for Seniors? Juniors? Sophomores? Freshmen?

I am going to try to cover a couple of different things today, including:

- The role of graduate fellowships and scholarships. Why might you want to apply for a fellowship, why you might not want to apply.
- Generic advice for what you should be doing as an undergraduate to position yourself for a graduate fellowship or scholarship.
- Information about the largest and most prestigious graduate fellowship program, the NSF Graduate Research Fellowship Program. I will be covering this in some detail, but I think that a lot the information will also apply to many similar programs that are out there and possibly to graduate school applications.

Now, a lot of this information is available online, and a lot of what I am about to say is either borrowed from the website of the National & International Scholarships Program here on campus, or from a presentation given in fall 2009 by Dr. William Hahn, the former director of the NSF Graduate Research Fellowship Program. I heard that he may be on campus for another seminar again this fall.

Since this information is out there, I do think that the primary value today really is in the discussion. Therefore, as I go through the slides, I want to invite the panelists to chime in at any time with observations (especially if you think that I have made a mistake). Students, if you have a question, raise your hand as I get to the end of a slide.
What role do fellowships play? I think that quite a few undergraduates hear about the costs of a graduate education, and think that they will have trouble paying for it. The fact is that if you are admitted to a top CS graduate program in the U.S., the issue is not about finding a way to pay. You will have funding offered in the form of a teaching or a research assistantship, and both of these usually come with tuition waivers. The question really is: how will you be spending your time?

There are three primary funding sources for graduate students: teaching assistantships, research assistantships, and fellowships. There are benefits and drawbacks for each. A teaching assistantship will provide valuable life experience for anyone who has a goal of becoming a teacher. A research assistantship will provide valuable experience in seeing how research is done.

In contrast, a fellowship frees your time to work on your own research or coursework. Also, the funding may be more stable. Your adviser’s grant can run out (and force you to do a TA instead of an RA), or the state can face budget problems and slash funding. After you win a fellowship, the funding is guaranteed.

The fellowship’s drawbacks?

- You will not have the experiences that TAs or RAs will have, but I think whether or not this is a drawback depends on how you use your “free” time. Are you going to use your time wisely? Or are you someone who needs structure?
- Also, most universities will require you to be registered for a certain number of hours while you hold the fellowship. Some fellowships will be longer than the 9 month academic year, so they may limit what you can do over the summer because of the registration requirements.
Okay, so, if you are interested in a graduate fellowship, what should you be doing now? That depends a bit on where you are, and it depends a bit on the scholarship or fellowship. But the things that you should be doing to position yourself for a fellowship are many of the same things that you should be doing for graduate school.

For the biggest and most prestigious fellowship programs, the single most helpful quality is undergraduate research, especially research that leads to a publication. Undergraduate research is also one of the best ways you can distinguish yourself on your graduate school applications.

So you should be doing things that build relationships with faculty members, that lead to research opportunities, that lead to leadership opportunities in extracurricular activities, and that allow you to explore your interests and to develop your talents.

The slide lists some more concrete ideas that I have borrowed from The National & International Scholarships Program’s website.

Generic advice:

- Take courses that will enrich your academic career and/or are of interest to you. Don’t go for the easy grade at the expense of taking a challenging and enriching class.
- Avoid large lecture classes whenever possible; but if it can't be helped, be doubly sure that you take advantage of the professor's office hours.
- Get off the couch! Get involved in significant extra-curricular and service activities. Don't just join organizations for a "line on the resume".
- Develop mentoring relationships with faculty, staff, and your peers.
- Get to know your advisor and department faculty.
- Go to faculty office hours and discuss academic and social concerns and interests.
- Seek out research and/or independent study opportunities.
- Explore & develop your various interests and talents--don't be shy and don't let unique or interesting opportunities pass you by.
- Use your summers wisely: partake in research, internships, and community service projects in the US or abroad. Consider applying for an REU (Research Experience for Undergraduates).

[More]
Freshman and Sophomore Years:
It is not too early to start thinking about research, and it is not too early to try to build relationships with faculty members. Now, some faculty will identify students who they want to work with through upper level classes, and some may want you to have taken one of their upper level classes first, but I know that some are excited to work with underclassmen. They know that if they are able to invest time and mentor you for a couple of years, then when you are a senior, you are more likely to be doing work and contributing at the level of a graduate student.

Also, consider the timing of graduate school and fellowship applications. These are mostly due in the fall of your senior year. If you wait until senior year to get involved with research, that’s too late to make a difference on those applications.

Junior Year:
Do an honors thesis or other major research or independent study project. I would suggest that, if you need a way to jumpstart this, Professor Angrave’s Undergraduate Research Lab may be a good place to start.

Junior and Senior Years:
You should be gathering information about where you might want to do graduate studies; this might include contacting faculty at those institutions.

You should be applying for fellowships, scholarships, and graduate school.

Many fellowship and graduate school applications will require one or more essays. Consider starting work on a personal statement and/or a research statement now. These statements may require several rewrites to get just right. The payoff is polished materials that can be adapted according to the fellowship or graduate program that you are applying for.
Federal research fellowship programs where seniors or first year graduate students are eligible include the National Physical Science Consortium Graduate Fellowship, National Defense Science and Engineering Graduate Fellowship, DOE Computational Science Graduate Fellowship, NASA Aeronautics Scholarship Program, and NASA Graduate Student Researchers Program. The last few years, I have posted deadlines and links for these on the student awards Agora wiki.

Today, I am focusing on the NSF program because it is the oldest and largest graduate fellowship program.

What is the NSF Graduate Research Fellowship Program? First of all, it is run by the National Science Foundation was created in 1950 to promote the progress of science. The NSF has a very large budget.

The NSF Graduate Research Fellowship is the oldest NSF program. It is also a fairly large program, having helped over 44,000 students over the years. There are about 2800 students currently being funded, with another 700 who have deferred the fellowship until later in their student career. NSF Fellows tend to be very successful.

The Fellowship provides some very nice support. Fellows get three years of support over a five year period, meaning that the fellowship may be deferred for up to 2 years, which is useful should you be offered another fellowship. There’s no need to apply for a renewal. If you win, you have three years of funding. The fellowship has a very nice stipend, and covers a good part of tuition, a bit of travel, and access to Teragrid.

The Fellowship is portable, flexible, and does not have any service strings attached. Honorable Mentions also get Teragrid access, and those students may reapply, so long as they are still eligible. Extra funding is allocated for Women in Computer Science and Women in Engineering. Dr. Hahn did not give any numbers for this, but Cornell had something posted on its website that there are 90 fellowships allocated there.
Here we have some numbers about success rates and the future of the program. In the past, this fellowship has been awarded to about 1,000 students each year, with a typical success rate of 14 percent. However, Dr. Hahn indicated that CS applicants typically do a little better than average (only a few percent).

However, the size of the program is tripling and is expected to hit 3000 fellowships per year by 2013. Dr. Hahn estimated that there would be 1650 fellowships awarded for this upcoming academic year. NSF has announced the winners, and his guess was low. There are 2001 winning students. “Computer and Information Science and Engineering” receives about 5% of the fellowships awarded each year. The numbers this year bear this out; there were 103 fellowships awarded in this area for the upcoming academic year.

The slide lists some of the eligibility criteria. Yes, you do need to be a U.S. citizen, national, or permanent resident, and that also goes for the other awards that I mentioned earlier. Applicants are compared against others at the same “level”. So seniors are compared against seniors, not grad students. The review committees look at Level 1 first. Level 1 applicants do have a slightly higher success rate than that of other levels.

Students from all NSF-supported fields are eligible. However, students in JD/Ph.D. and M.D./Ph.D. programs are not eligible.

Applications are due early each November, and the NSF usually posts requirements each August, but the slide lists the materials that you will need to provide.

This is more like an application for graduate admission than a research proposal. Note that the GRE is optional. About 30% of applicants do not submit a GRE. A low GRE score is not an automatic disqualification. Dr. Hahn said that there are some awardees with “surprisingly low GRE scores.” As a whole, your materials need to address two criteria: the Intellectual Merit, and the Broader Impacts.
[Slide 14]
Intellectual Merit:
The slide shows the language used in the NSF Program Solicitation explaining how reviewers will assess intellectual merit.
- The single most helpful quality is undergraduate research, especially research that leads to a publication.
- The research plan must be a viable plan. What constitutes a viable plan depends on the level of the student. For example, seniors do not need to have a thesis topic chosen.
- For your choice of institution, do not pick a boutique school. Reviewers know which schools are strong and are likely to help you reach your goals. You can always change your school choice after you win.

[Slide 15]
Broader Impacts:
Again, the slide shows the language used in the NSF Program Solicitation explaining how reviewers will assess broader impacts.
- What have you done in the past which suggests that you can deliver?

[Slide 16]
Personal Essay:
I am not going read everything on the slide. But the personal essay is your chance to address the broader impacts criterion: what is your motivation, past experience, unique characteristics?

[Slide 17]
Previous Research Essay:
Again, I am not going read everything on the slide, but I do want to emphasize that you should include all examples of research, even stretching back to high school. Ideally, elements of past research should show why you are interested in your proposed research.

[Slide 18]
Proposed Research Essay:
Again, I am not going read everything on the slide. Dr. Hahn recommended possibility talking with people in your chosen school and program so that you know what is currently going on and so that you can intelligently discuss how that program might help your research. However, he recommended that your proposal should not necessarily be tied to any specific adviser.
What will be your research’s relevance to both the field and to greater society?
Your statement should have a clear hypothesis.
Mention any preliminary results.
This slide contains some advice given by the students, and some answers to questions at last fall’s information session with Dr. Hahn. If you are working with a faculty member, talk to them about the research statement. Both of the students at last fall’s session indicated that they had worked extensively with their adviser to craft their research statement. Working together also helped advisers write their letters of recommendations. The NSF recommends that you start on your application, that is drafting essays, 3 months before the November deadline. One of the students at last fall’s session started in July, the other in August. One said that in working with his adviser, they went through twenty revisions of the proposal.

The letters are going to be similar to graduate school admissions letters. These should be people who know you as a scientist and as a person. One thing that Dr. Hahn said: don’t get a letter from a member of Congress. Chances are that they don’t know you, and these letters can create extra work and headaches for NSF program officers. In fact, he said that he feels that this sort of an attempt to bring political clout into a scientific review process is offensive.

Sometimes, believe or not, sometimes faculty have to be reminded to turn in materials. Fastlane, the application submission system, lets you track letters. Do not be afraid to send reminders.

When you are writing this sort of an application or proposal, you do want to write to the reviewers. The review panel will be comprised of computer scientists, but they are not necessarily going to be in your research area. So, you need to write to a general computer science audience.

Your application will be evaluated by 2 panels comprised of 2-3 members each. There is an additional review for highly ranked applications, so winners and honorable mentions will have received 4 evaluations. There may be additional reviews if a conflict of interest appears.

90% of the award determinations depend on the panelist’s rankings.

On the lower end of the ranking, factors like funding issues, and geographic location may come into play.

Rating sheets are provided to eligible applicants, so you know what you need to improve for a second attempt.

Panelists are asked to consider how the applicant played the hand they were dealt.
[Slide 22]
This slide has a listing of who, under NSF, you should contact with questions, in order of preference. Note that nsfgrfp.org has a listing of people who have volunteered to assist with applications. They appear under “Applicant Resources.”

[Slide 23]
- Ken Vickery, Director of External Fellowships, vickeryk@illinois.edu
- link to Tim’s page http://www.cs.illinois.edu/homes/weninge1/research.html
- Upcoming workshops.
  - Note that there is a workshop tomorrow from 3:30 to 5 pm in room 66 of the main library for Fulbright IIE grants.

[Slide 24]
Agora URL.
I do need to update this for the new academic year. In the meanwhile, to get an idea of when deadlines might be, you can see number 4, “Past Announcements” in the list.