Session 2:
Preparing a Strong PhD Application

Thursday, September 12, 2024 (7 pm ET)

CSGRAD4US

Graduate Fellowship & Mentoring Program

CSGrad4US Mentee Timeline

Before being selected as a Fellow

- Undergrad degree in CS or related area
- Industrial experiences
- Interest in and potential for a PhD

Early Fall 2024

- ❑ Update your resume
- ❑ Draft SOP/Personal Stmt.
- ❑ Identify letter writers
- ❑ Select schools to apply to
- ❑ If needed, study for and take GREs

Late Fall of 2024

- ❑ Ask letter writers
- ❑ Give them resume, SOP & transcripts
- ❑ Finalize application materials and get feedback
- ❑ Submit applications (Nov-Dec)

Spring 2025

- Hear from schools
- Visit schools
- Make a decision!

[CSGrad4US 2024 Schedule]

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Chat question: Are there Mentees who had no admission?

Yes. Reasons are diverse

- Did not listen to the coach
- Applied to few programs and had a narrow research area
- Had AI/ML as the chosen research area with little/no research experience
- Had narrow interests in a highly selective research area (e.g., quantum, AI, ML)
- Stated a specific thesis topic
- Applied to 6 or more programs, with almost all being highly selective
- Applied to 1-3 programs and had significant geographical constraints
- Was unlucky

What did they do?

- Majority revised/refocused the application material and applied again and had admissions

The Four Major Application Components

SOP/Personal Stmt (if needed)

Transcript(s)

Deceptively Simple:
Need to Create Your Story

Letters of Recommendation

GRE Scores (if required)

Learning Objectives

Describe What PhD Programs Want

- Application logistics
- Evidence of expected background & experience
- Evidence of skill set
- Evidence of mindset

Brainstorm What You Have

- Research & industry experiences
- Advisors/mentors/bosses
- Technical skills
- Work personality
- Your research story & passion
- Your coach

Application Materials

- ***Transcripts and GREs***
  - Demonstrate technical knowledge and learning capabilities
- ***Resume (1-2 pages)***
  - Highlights research and work experiences. Include specifics on skills (hard and soft).
  - References to online portfolio of technical projects
- ***Statement of Purpose (1 page)***
  - Document your (research-relevant) experiences. Describe your technical skills.
  - Explain your path to research interest and specific area of interest. Demonstrate some knowledge of chosen research area.
  - Discuss work characteristics and growth experiences related to research
- ***Personal statement (requested by some schools)***
  - Personal journey, including personal obstacles or blips
- ***Letters of recommendation (3-4 people)***
  - People who can vouch for your intelligence, accomplishments, creativity, perseverance, potential for research, and other desirable attributes.

What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?

Have you taken courses/are knowledgeable on expected background?

- For CS programs, this includes
  - data structures, algorithms,
  - systems programming, and
  - various electives
- For I-School programs, did you explore interdisciplinary background expectations?
- Have you taken advanced, grad-level, or challenging courses?

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1 Minute Exercise:

Write down CISE courses you have completed and categorize (e.g., core, elective, grad-level, research-based)

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What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?
- Do you know what research is?

Have you

- worked on a research project during ugrad,
- taken an independent study during ugrad,
- researched techniques for solving a complex technical problem at work, or
- created a side project learning about state of the art approaches?

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1 Minute Exercise:

Write down your research, research-related, or other investigative activities

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What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?
- Do you know what research is?
- Are you creative?

Have you

- recognized bigger implications of results for some technical solution,
- designed new technical solutions for a project at work,
- made connections between two unrelated topics to solve a problem?

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1 Minute Exercise:

Write down problems you identified or solutions you designed or other tasks you did demonstrating your creativity

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What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?
- Do you know what research is?
- Are you creative?
- Are you self-motivated, hard-working, and persistent?

Have you

- taken independent study courses or advanced courses,
- identified key problems that need to be solved on a project,
- shown a commitment to learning specific topics,
- dedicated significant time and energy to a project,
- seen a project through to completion,
- continued working to find a solution after a first approach failed?

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1 Minute Exercise:

Write down difficult projects you completed and/or initial failures you overcame

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What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?
- Do you know what research is?
- Are you creative?
- Are you self-motivated, hard-working, and persistent?
- Can you work independently? Can you collaborate with others?

Have you

- taken on a specific piece of a project as your own,
- worked as a leader of a group for a specific piece of a project,
- worked collectively with others on a larger project?

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1 Minute Exercise:

Write down projects you took initiative on or were a group leader

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What Are CISE Grad Programs Looking For?

- Do you have expected computing knowledge/CISE competency?
- Do you know what research is?
- Are you creative?
- Are you self-motivated, hard-working and persistent?
- Can you work independently/ collaborate with others?
- Do you have a research area that excites you?

Have you

- worked on a research project in an area that excites you;
- worked on a technical problem at work that makes you want to dig deeper;
- worked on a personal project whose topic you want to research formally?

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1 Minute Exercise:

Write down a research area and research topic within this area that excites you and why

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Let's Look More Closely At Individual Application Parts

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What a Resume Should Include

Academic background

- Degrees; Computing courses in college, course work or certifications since college

Projects/employment/research

- Description of work topic
- Specific tasks and any leadership roles or independent tasks
- Outcomes - software applications, training materials, publications, web pages

Technical competitions and awards

- CSGrad4US Fellowship awardee, including years and level of funding
- May include ACM Programming contest, Math Olympiad, Putnam exam (incl. scores)

Skills

- Technical skills (e.g., programming languages, tools, libraries, etc.)

Personal Portfolio and Activities

- Links to web pages for open-source or personal projects
- Computing outreach or volunteer work

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Creating a Professional Online Persona

- Have a LinkedIn page
- A personal webpage gives you a place to provide more details about you and your work. Include:
  - Research interests
  - Publications and projects
  - Link to CV/bio
  - Teaching materials (if you have any)
  - Media coverage (if you have any, but no worries if you don't)
  - Some personal information (if you want to share, but not required)

Creating a Strong Resume

- ***Opportunity to provide more information than just the statement of purpose***
  - Can provide more information on specific job activities
  - Can provide information about technical extracurricular activities
    - Including links to online presence and portfolio
  - Can provide information about specific technical skills
- ***Be succinct and use active words***
  - Own your contributions and successes
  - Discuss independent and creative work
  - Specify leadership and collaborative experiences

Resumé vs CV (curriculum vitae)

- A resume is concise, brings up skills and experiences.
- A CV is longer and includes more details.
  - Academics use CVs. Can be many pages long and cover research, teaching and service activities.
- Both have to be kept up to date. Everything relevant should be added regularly.
- The resumé is tailored to the specific recipient (industry, academia, granting agency, etc).
- There are many career centers that provide examples and guidelines for resumes for different levels.

For Next Session: Critique Statement of Purpose

- Review sample resume and Jane Doe's statement of purpose on Canvas
- Identify 3 improvements to the statement of purpose
  - Discuss your concerns and any improvements with your coach next week
  - Add your comments to your groups file (for cohort 4 mentees only)
  - We will discuss at start of Session 3

Writing an Effective Statement of Purpose

- Describe any prior research or research-relevant experience
- Describe your area of interest, your background in this area (courses, projects, etc), and articulate possible research questions of interest to you
- Describe your reason for wanting to get a PhD
- Personalize your statement with at least one paragraph about why the department and/or specific faculty interest you
- Discuss any discrepancies or rough patches on your path
    - Might be contained in Personal Statement instead

What is Motivating You?

- ***Why did you go to industry after college?***
  - Wanted to explore opportunities in the workforce
  - Didn't know what research was
  - Financial (including loans) and family commitments
- ***What is motivating you to now want to pursue a PhD?***
  - You discovered a topic you're passionate about
  - You want to work on different, more open-ended problems
  - You want to be the person determining questions being studied
  - You enjoyed research while in college and always intended to return to graduate study

1 Minute Exercise: Motivation

Write down your motivations for going to industry in the past and for pursuing a PhD now

To do: Weave Answers to All Slides Together in the SOP/PS

Use answers to earlier questions:

- How have your experiences (in research, industry, extra-curricular activities) shaped your motivation to get a PhD?
- How have your experiences shaped what interests you?
- How have your experiences helped you develop skills needed to get a PhD in chosen area?
  - Technical skills
  - Soft skills (e.g., leadership, collaboration, communication)
  - Personal characteristics (e.g., persistence, initiative)
- How has recovery from failure strengthened your ability or commitment to pursuing research?

Breakout Rooms - 10 mins

Choose one of the two topics and present within the group

- One experience after your UG degree that motivated you to pursue a PhD that you may weave into your SOP
- One personal strength or challenge you overcame that you may highlight in your Personal Statement

Writing the SOP will be harder and take more time than you expect

- Send a clear and precise message about you and your research potential and your research interests
  - Can be hard to do within a word/page limit
  - Material prepared for CSGrad4US applications was often an essay about applicant's life journey
- You don’t know the audience
- Coach will give feedback, but you shouldn't expect rewrites
- Make use of writing resources
  - Online resources; books
  - A professional writer/writer friend
- Start early and revise frequently based on feedback

Statement of Purpose: Selected resources

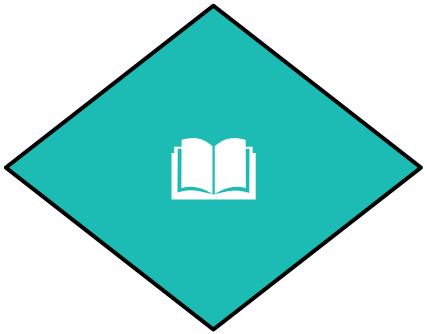
- How to Write a Bad Statement for a Computer Science Ph.D. Admissions Application by Andy Pavlo (CMU)
  - May be amusing to read, but we see such statements every year
- Applying to Ph.D. Programs in Computer Science by Mor Harchol-Balter (CMU)
  - Aligns well with the material we present; some 2014 info may no longer be current
- Example of a statement of purpose written by a student who was accepted and enrolled (2016) (made available by MIT EECS Communication Lab)
- Selected CS PhD SOP's: from admitted students (most with research experience)

See "Resources" on Canvas for more

Personal Statement

- Some programs ask for a second statement
- Discuss your personal journey to wanting to get a PhD in CISE
- Opportunity to explain challenges or obstacles you have overcome, such as
  - Marginalization due to identity
  - Academic terms with lower GPA
  - Family responsibilities that prevented research exploration
  - Undergraduate department disbanded
- May contain content from your CSGrad4US application

Getting Strong Letters of Recommendation

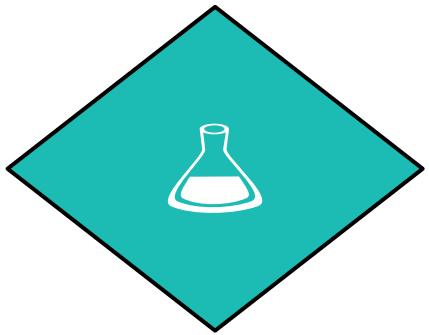


3-4 Letters Typically Required

Have at least one letter from a faculty member with whom you worked closely. No letters from TAs. Limit letters from lower-level instructors.

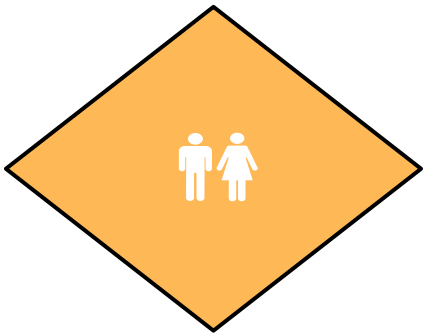
Make Each Letter Count

A letter that only says *"this student did well in my class"* is not very helpful.



Letters from Other Disciplines

It can be hard to find 3-4 CS professors who know you well. It's okay to have letters from faculty in related fields (e.g., EE, Math, etc.)



Work Supervisors

A letter from a work supervisor is good. They can speak to recent work experience.

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Determining Who to Ask

Letter writers corroborate your story through their observations of you

Who can attest to criteria being looked for in grad school application?

- Attest to your problem-solving abilities
- Attest to your intellectual capability
- Attest to your creativity
- Attest to your potential to engage in research
- Attest to your ability to work independently
- Attest to your ability to work in a group, working well with others
- Attest to your ability to lead a group
- Attest to your written and verbal communication skills
- Attest to your ability to recover from failure and persevere
- Attest to your ability to work hard
- Attest to any challenges you faced along the way

1 Minute Exercise: Brainstorm People

- Did you work with a faculty member on a research or software development project?
- Did you do a research internship, perhaps at another school, at a lab, or in industry?
- Did you take an advanced class from a faculty member and later serve as its TA?
- Did you work on a development team implementing cutting edge techniques or research ideas? Could the lead of that team speak to your strengths?
- Do you have a work mentor/boss who can speak to your independent work, creativity, perseverance, follow-through, ability to adapt to lack of initial success or challenges, ability to collaborate, and/or ability to lead a group?

How to Ask for a Recommendation

- ***Ask at least a month in advance***
- ***Ask if they can write a strong, positive letter and give them a way to say "no"***
  - *"I'm applying to graduate school. Would you feel comfortable writing a positive letter for me? If so, I'd be grateful. If you are not able to do this for any reason, I'll certainly understand."*
- ***Provide building blocks for their letter***
  - Application (resume, statement of purpose, web presence)
  - Reminder of significant events that you participated in and excelled at
  - Provide them with a letter describing the Fellowship that we'll give you
  - Offer to have a conversation to update them on your career and goals
- ***Provide industry writers with guidance on what to include***
  - Concrete experiences and projects
  - Personal characteristics - Independence, creativity, motivation, follow-through, communication, leadership, teamwork, etc.

GRE Exam and Scores

Check if GRE Scores are required by the institutions that you are applying to

Prepare for the exam! Taking practice tests can help immensely

You can retake the exam if you feel you could do better.

Resources:

- https://www.princetonreview.com/grad/gre-information
- http://www.ets.org/gre

Questions?

Have Questions later? Join Office Hours!

Office Hours: Tuesdays, 8-9pm ET

SESSION 3

Thursday, September 26, 2024, 7:00-8:30 pm ET

PhD Application Process, Identifying Programs and Schools

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