

# Session 2: Preparing a Strong PhD Graduate Application

Thursday, September 14, 2023 (7 pm ET)

**CSGRAD4US** & mentoring program

Computer and Information Science and Engineering Graduate Fellowships



CRA-WP  
Computing Research  
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Widening Participation



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# The Four Major Application Components

Personal  
Statement(s)



Transcript(s)

**Deceptively Simple:  
Need to Create Your Story**

Letters of  
Recommendation



GRE Scores  
(if required)



# Learning Objectives

## Describe What Schools Want

- Application logistics
- Evidence of 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



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# Application Materials

- ***Transcripts and GREs***
  - Demonstrate technical knowledge and learning capabilities
- ***Resume (1-2 pages)***
  - Highlights research and work experiences
  - Specifies learned skills (hard and soft)
  - References to online portfolio of technical projects
- ***Personal statement (1 page)***
  - Document your experiences
  - Describe your technical skills
  - Explain path to research interest and specific area of interest
  - Discuss work characteristics and growth experiences
- ***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 Grad Schools Looking For?

- Do you have basic 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

Have you taken advanced, grad-level, or challenging courses?



# 1 Minute Exercise:

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



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# What Are Grad Schools Looking For?

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

## Have you

- worked on a research project during undergrad,
- taken an independent study during undergrad,
- researched techniques for solving a complicated 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 or other investigative activities**



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# What Are Grad Schools Looking For?

- Do you have basic 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**



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# What Are Grad Schools Looking For?

- Do you have basic 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 projects you completed  
and/or initial failures you overcame**



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# What Are Grad Schools Looking For?

- Do you have basic 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 Grad Schools Looking For?

- Do you have basic 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 research topics  
that excite 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***

- 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
- 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



# 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 any, no worry if you don't)
  - Some personal information (if you want to share, not required)



# Creating a Strong Resume

- ***Opportunity to provide more information than just the personal statement***
  - 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 Personal Statement

- Review sample resume and Jane Doe's personal statement on Canvas
- Identify 3 improvements to the personal statement
  - Discuss your concerns and any improvements with your coach next week
  - Add your comments to [your groups file.](#)
  - We will discuss at start of Session 3



# Writing an Effective Personal Statement

- Describe any prior research experience
- Describe your future research interests
- Describe your reason for wanting to get a PhD
- Demonstrate that you have ideas for interesting and important problems to study
- 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



# What is Motivating You?

- ***Why did you go to industry after college?***
  - Tired of studying
  - Didn't know what interested you
  - Family commitments
  - Student loan repayment
- ***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 and now for pursuing a PhD



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# Weaving Pieces Together to Tell Your Research Path Story

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?



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## 2 Minute Exercise: Reflections

Reflect on the questions listed on the previous page, making connections



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# Breakout Rooms

Discuss one personal strength or challenge you overcame that you may highlight in your Personal Statement



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# Writing the Personal Statement will be harder than you expect and take more time

- 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 don't expect rewrites
- Make use of writing resources
  - Online resources
  - A professional writer/writer friend
  - Books
- Start early and revise frequently based on feedback

# Personal Statement and more: 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 material we present; obviously some 2014 info is no longer current
- [Example](#) of a personal statement written by a student who was accepted and enrolled (2016), made available by MIT EECS [Communication Lab](#)
- [Graduate Admissions Essays](#) by Donald Asher (4th edition)
  - Book that is not specific to computing, but has useful general advice and examples

# 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 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



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# 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, 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 folder for their letter**
  - Application (resume, statement of purpose, web presence)
  - Reminder of significant events that you participated in and excelled at
  - We will provide a letter describing the Fellowship
  - 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



Investigate the expected GRE score ranges, and the scores importance to the application



Prepare for the exam! Taking practice tests can help immensely



You can retake the exam if you feel you could do better. However, the previous scores will still appear on your application

## Resources:

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



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# Questions?

Have Questions later?

Office Hours: Tuesday, 8-9pm ET

## SESSION 3

**Thursday, September 28, 2023, 7:00-8:30 pm ET**

PhD Application Process, Identifying Programs and Schools



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