Grad School Stuff for Undergrads

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This Talk

1. **Should you go to grad school?**
2. **How to get into the right grad school?**

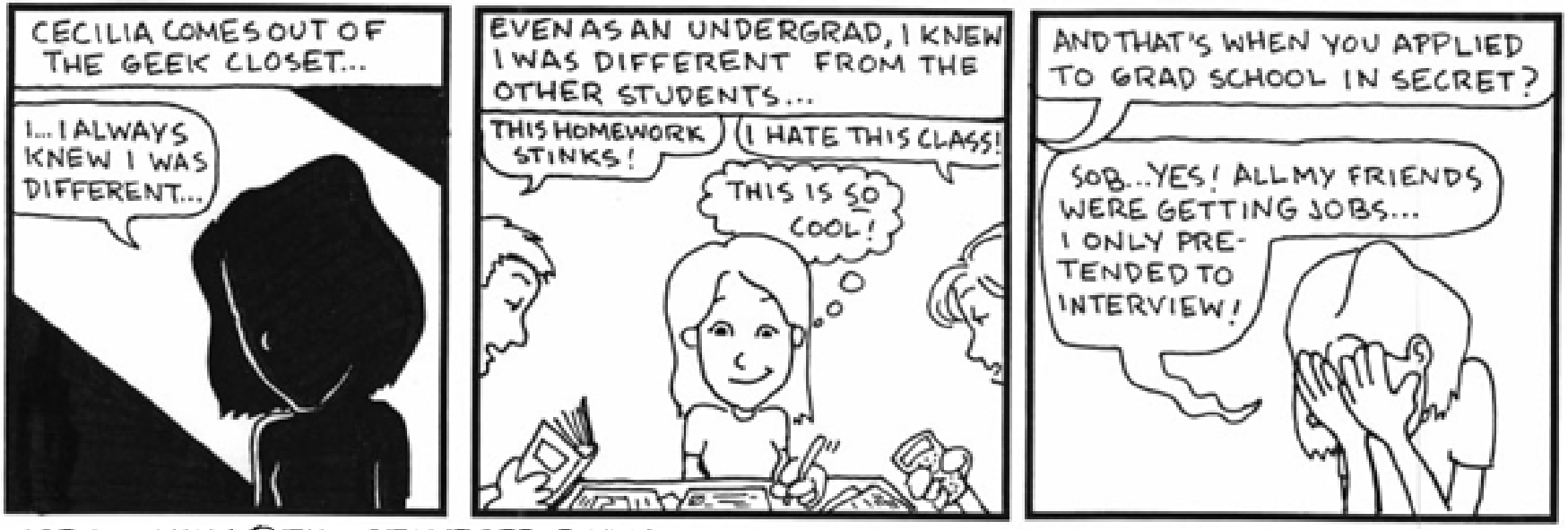
- **Motivation**
  - **Nobody else seems to be telling you this stuff…**

After Graduation

- **Your choices:**
  - **Get a job**
  - **Go to grad school**
  - **None of the above**
    - **Ski bum**
    - **Stay-at-home parent**
    - **…**

Some Things are Obvious

- If you aren't enjoying college, don't go to grad school
  - MS == More of the same
  - PhD == Piled higher and deeper
- If you aren't doing well in college, don't go to grad school
  - You'll have a hard time getting into a good one
  - It's more competitive than being an undergrad
- Grad school can be a lot of fun
  - But it's not for everyone



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Less Obvious…

- Salary tradeoffs for an advanced degree are unclear
- You will lose 2 (MS) or 4-7 (PhD) years of your life
- As an MS or PhD student you write a thesis
  - You MUST be able to, or learn to, write clearly and fairly rapidly
  - Bad writing or too much writers block == no degree
  - MS == 50-100 pages
  - PhD == 100-250 pages

Grad School Tradeoffs

- **Costs**
  - **Time**
  - **Effort**
  - **Expense**
  - **Opportunity costs**
  - **Potential for failure**

- **Benefits**
  - **Enjoyment**
  - **Possible increased earning power**
  - **Opens doors to different kinds of jobs**
  - **Possible outsourcing-proofness through specialization**

Why get an MS in CS?

- **To be:**
  - **A software developer**
  - **A research programmer**
  - **An instructor at a two-year college**

Why Get a PhD in CS?

- **To become a:**
  - **Professor at a university**
  - **Researcher in an industry lab**
  - **Manager of research projects**

Essential PhD Information

- **Being a PhD student is very different from being an undergrad**
  - **As an undergrad your job is to get good grades**
  - **As a PhD student your job is to learn to do research and write papers**
    - **Classes largely a distraction**
  - **Many new grads take a few years to internalize this**
    - **Don’t be one of them**

- **Being an MS student is more like being an undergrad than like being a PhD student**
  - **Especially if pursuing a course-based MS**

Should You Work First?

- Often people want to get some work experience before returning to grad school
- Can be beneficial
  - Increased maturity
  - Better perspective
  - Particularly useful for some research areas, e.g., systems
- In practice few people return for advanced degree
  - Hard to take the huge salary cut
  - Homework and exams start to look unattractive after a few years “out there”

That’s it for Part 1

Questions?

Parts of an Application

- Grades
  - Bad grades hurt but good grades don’t get you in
  - Should have As and Bs in core courses
- GRE scores
  - Bad scores hurt but good scores don’t get you in
  - Straight 800s not uncommon in applications to Stanford
  - Attend our review sessions
- Prior research experience
  - Required at top graduate schools
  - Makes any application (possibly much) stronger
- Research statement
- Letters of recommendation

Research Statement

- Also called “personal statement”
  - Don’t be fooled – it’s a research statement
- Include:
  - What general research areas interest you and why
  - Research projects you have worked on
    - Approaches that you tried
    - What worked, what you learned
  - Why do you want an MS / PhD?
  - Why do you want to attend the particular school?
  - What professors might you want to work with?
- Take this seriously
  - Get people to read over it, especially professors
  - Bragging, exaggerating, cheesy stories do not help

Letters of Recommendation

- Letters from professors count the most
  - Letters from postdocs, lecturers, employers, etc. are a distant second
- Letters about your grades and exam scores are worthless
  - If someone wants to know how you did in class they'll look at your transcript
- If the professor doesn't know you well, she cannot write you a strong letter
- A good letter says things like
  - "independent thinker"
  - "motivated and driven"
  - "strong research potential"

How to Ask for Letters

- **Ask in person**
  - **Be specific: “Can you write me a strong letter?”**
- **Provide each letter writer with a packet containing:**
  - **Your resume**
  - **Your research statement**
  - **As much paperwork filled out as possible**
  - **Anything else that may be helpful**
  - **Specific instructions – Which letters are due when?**
  - **Addressed, stamped envelopes**
  - **Request for email confirmation when letters are sent**
- **Assume professors are overworked and forgetful**
  - **Give them at least three weeks to write and send letters**
  - **Check to see if schools have gotten your letters**

Getting Into a Good School

- **Basic problem #1**
  - **Acceptance is highly random**
- **Solution**
  - **Apply to many schools**
    - **At least 10, if you're serious about it**

- **Basic problem #2**
  - **You have no idea how you stack up against "the competition"**
- **Solution**
  - **Apply to departments with a wide range of rankings**
    - **E.g. apply to both Berkeley and Western Kentucky Tech**

Will You Be Accepted?

- **Algorithm used by admissions committee:**
  1. **For each area, decide how many MS and PhD students to accept**
  2. **Accept the N strongest MS students and M strongest PhD students who listed that area as their main interest**

- **However:**
  - **"Strongest students" is both random and subjective**

- **Good for you:**
  - **Domestic applicants preferred over foreign applicants**
  - **Applications from China, India, etc. are numerous and hard to evaluate**

Will You Be Offered Support?

- **Algorithm used by admissions committee:**
  1. **For each area, decide how many students can be offered support**
  2. **Support the N strongest PhD students who listed that area as their main interest**

- **MS students rarely offered financial support**

Kinds of Support

- **TA – teaching assistantship**
  - **You help teach a course**
  - **Somewhat desirable**
- **RA – research assistantship**
  - **You are paid out of a grant**
  - **You have to contribute towards the grant**
  - **More desirable**
    - **Work towards the grant should also move you towards a degree**
- **Fellowship**
  - **Most desirable**
  - **Some are offered to you, some have to be applied for**
- **Single-year vs. multi-year offer**

So You Have Multiple Offers

- **Find out:**
  - **How many professors are looking for new students?**
  - **How many professors are doing research you are excited about?**
  - **The intersection of these sets is your pool of potential advisors**

- **Pick a well-ranked school**
  - **U.S. News and CRA rank CS departments**
  - **Good ranking == well-perceived department**
  - **Good ranking makes it easier to get a good job**
  - **Good ranking != quality education, fun place to be**

Choosing a School Cont'd

- **Visit**
  - **If they care about you, they'll fly you out**
  - **Bad sign if they won't do this**
  - **Are current grads there:**
    - **Happy and being treated well?**
    - **Working hard and publishing?**
    - **Getting good jobs?**
  - **If you get bad vibes, don't go there**

- **Pick somewhere you don't mind living for a while**
  - **Evaluate salary vs. cost of living**
  - **$1700 / month in Boston or NYC will get old after 6 years**

Application Timeline

- **Freshman, sophomore, junior year:**
  - **Get good grades**
  - **Get research experience**
  - **Find research areas that excite you enough to devote 2-7 years of your life to them**
- **Early Fall of your senior year:**
  - **Decide where to apply**
    - **Do lots of web surfing**
  - **Take GRE**
- **Late Fall of your senior year:**
  - **Fill out applications**
  - **Request letters of recommendation**

Almost Done

- There is a lot of good information on the web
  - Google is your friend

- This talk is “Part 1”
  - Part 2 is targeted towards new grad students
    - I give this each Fall
    - Basically, how to succeed as an MS / PhD student
    - PDF is linked to my “research” web page

Questions?