Graduate Life

PETROS DRINEAS

Congratulations!

- You were admitted to the graduate school of a great university.
- Even better, you were admitted at the Computer Science department: **Computer Science is the hottest research area in the 21st century.**
  - I am not just saying this to make you feel better, wait until the next slide.
- To achieve this, you excelled in your undergraduate studies.
- If you have not already done so, you should **take some time and congratulate yourself.**

Why is CS great?

▶ Computers are everywhere.

▶ **All scientific domains and business endeavors need *computational thinking* to succeed.**

▶ As a Computer Scientist you can work **anywhere:** in Wall Street firms, law firms, you can work on the Human Genome Project, work in med-/chem-/etc. informatics, switch to mathematics and do theory, etc.

▶ The versatility is unbounded and the sky is the limit.

▶ **Big Data** have made the situation even better for Computer Science graduates.

OK, now what?

▶ Well, you are starting a voyage...

▶ As a famous poet (Constantinos Kavafis, Ithaka [1911], translated by E. Keeley) wrote:

As you set out for Ithaka
hope the voyage is a long one,
full of adventure, full of discovery

...

Ithaka gave you the marvelous journey.
Without her you would not have set out.

...

▶ Ithaka is your PhD (or your MS) and graduate school is the voyage: during that time you will **grow both professionally and personally.**

OK, now what?

- Here is the ending of the poem:

> …
>
> *And if you find her poor, Ithaka won't have fooled you.*
> *Wise as you will have become, so full of experience,*
> *you will have understood by then what these Ithakas mean.*

- Yes, after graduate school, you will be wise and full of experience.

- I would also dare to say that, as Computer Scientists, you have a reasonable probability to find a non-poor Ithaka at the end.

Graduate life

- Most of my presentation caters to the PhD program: it partially applies to MS students as well, modulo the shorter duration of the program and much less exposure to research.

- The objective is to both enjoy the journey and achieve some goals.

- Reasonable *professional* goals: **(i)** graduate (say with a PhD, thus becoming Dr. <WHATEVER YOUR LAST NAME IS>, PhD) and **(ii)** get a job.

  - You can achieve **(ii)** without achieving **(i)**.

  - You can also achieve **(i)** without achieving **(ii)**.

- Reasonable *personal* goals: have a balance between personal life and work.

- It is important to be happy, at a personal level, in order to be successful in graduate school.

Graduate life

▶ Personal happiness will allow you to deal with the most common frustration of graduate school: FAILURE.

▶ It is also important to have **hobbies** to keep balance.

▶ Hobbies that keep you mentally (chess, arts, etc.) and/or physically (sports) fit are often beneficial to your work as well.

▶ During graduate school (especially during PhD studies) you might meet **your partner in life** and/or **start a family**: these are times to cherish and are even more important than reaching Ithaka (a.k.a., your PhD degree).

▶ **Word of advice on a *very personal matter*:** think carefully before deciding to delay personal life decisions (getting married, starting a family, etc.) because of graduate school.

▶ The remainder of this presentation will focus on the *professional* aspects of graduate life.

Milestones in graduate life

▶ **Pick an advisor.**

▶ **Write and defend your thesis.**

▶ **Get a job.**

▶ Secondary milestones: coursework, exams (quals, candidancy), form a committee, etc.

▶ All important milestones revolve around **research**.

▶ You can make good use of the secondary milestones as well!

  ▶ Coursework could lead to projects and papers.

  ▶ The PhD committee can really help in your research and also provide recommendation letters, etc.

Pick an advisor

► In my opinion, the **single most important choice** in a PhD program.

► Two properties of a good advisor for student **X**:

   ► Active in a research area that **X** is interested in.

   ► Somebody that **X** gets along with.

Pick an advisor

- I cannot stress enough how important it is to **get along** with your advisor:

  - Do you have similar work styles? E.g., working frantically the week before the deadline to submit a paper vs. finishing a paper well in advance?

  - Do you prefer close supervision vs. more hands-off supervision?

  - Do you feel comfortable when meeting your advisor? Meetings could be totally technical without any small talk (that's fine) or they could also involve advice regarding your personal life.

  - With high probability, you will have to adapt to your advisor's style and not the other way around.

  - You don't have to be friends with your advisor, but you have to get along with her/him.

Pick an advisor

- If you feel that your choice of an advisor is not working, consider switching advisors.
  - It's a delicate process, so be careful.
  - There will be blood, but you can try to minimize it.
  - At the end of the day, it's not as bad as a divorce, and if it is clear that both parties will end up with a better situation than before then the damage will be controlled.

Write and defend your thesis

- This will only happen after you have done a fair amount of research.

- (There was a separate presentation on research.)

- Obviously, research is the **heart and soul of a PhD program**; this is what you should be doing on a daily basis.

Write and defend your thesis

- Students often get lost in coursework, quals, Facebook, Twitter, etc. and forget the above fact, so I will repeat it:

Research is the heart and soul of a PhD program; this is what you should be doing on a daily basis.

Write and defend your thesis

- Your advisor will tell you when you are ready to defend your thesis; your committee will concur.

- Your thesis presentation should be **phenomenal**; for many, it will also be a job talk.

- There will be a separate presentation on giving talks; **yes, it is really important**.

- Your thesis writeup will typically consist of papers that are published, accepted, or under review.

- Some effort will be necessary to write a good intro and good conclusions (and good acknowldedgements).

Get a job

▶ Typical career paths after a PhD: academia (research/teaching positions), research labs (similar to academia), industry.

▶ Nailing a good job: you will need **visibility!**

▶ How to achieve visibility:

1. **Publish high-quality papers.**
2. **Present your work (talks, posters, tutorials, etc.) outside Rensselaer (recommendation letters).**
3. **Find summer internships (recommendation letters).**
4. **Impress the right people at conferences and workshops (recommendation letters).**

Get a job

1. **Publish high-quality papers.**
2. **Present your work outside Rensselaer.**
3. **Find summer internships.**
4. **Impress the right people.**

▶ You typically need **all the above**. Many students think that publishing high-quality papers is enough on its own; it's not. Even if you solved a major open problem, you will be forced to do 2, 3, and 4.

▶ Your advisor will probably force you to write and publish high-quality papers, but might not force you to do 2, 3, and 4.

▶ **Do them on your own!** Go to major conferences, even if your advisor cannot afford to support your travel. Spending money to go to a major conference to mingle and connect with researchers is a good investment. Many conferences have travel grants: apply!

Get a job

1. **Publish high-quality papers.**
2. **Present your work outside Rensselaer.**
3. **Find summer internships.**
4. **Impress the right people.**

▶ Talk to friends in other universities and make arrangements to **go and give a talk at a departmental seminar or at a group meeting**.

▶ **Actively look for summer internships**; don't wait for your advisor to do it for you.

▶ When going to a conference/workshop, don't sit in your room and watch TV. **Mingle with the participants!**

▶ *Anecdotal evidence:* I had one graduate student who was so good at mingling in conferences and workshops that people often thought that he was a colleague and not a student. He got great offers after graduating.

How to succeed in graduate school

► You must take responsibility for your own success. You can't just succeed by doing what you are told. **You need to go the extra mile.**

► Remember: research is the most important piece in a PhD program. The questions you are seeking to address are OPEN questions. Nobody knows the answer.

► Figure out what you need to do to solve them and **JUST DO IT** ™ !

► I know, easier said than done…

How to succeed in graduate school

▶ Failure will be way more common than SUCCESS!!

▶ You need to be able to strive in a setting where failure is so frequent: **perseverance** is the key. Remember, **it's a marathon, not a sprint**.

▶ You should try to acquire both **depth and breadth** in your research.

  ▶ Depth is a must: you have to be a **world-expert** in a particular topic.

  ▶ To achieve breadth: attend talks.

  ▶ To achieve breadth: talk to people that are not immediately relevant to your area of research.

  ▶ To achieve breadth: reserve time to talk to researchers outside Computer Science. Interdisciplinary collaborations are desirable and can boost your career.

Time management

- **Huge challenge**: it was tough even before the era of Facebook, Twitter, and other similar black holes.

- You have to **be organized**: set goals, break them down in smaller tasks, measure progress towards the smaller objectives and the larger goals.

- You can use software tools to get organized, but make sure that you don't spend more time getting organized than actually doing the tasks that need to be done.

- It's OK to procrastinate, as long as you recognize that you are procrastinating.

- Click here for a wonderful presentation by Yashar Ganjali of the University of Toronto on time management.

Dealing with conflict

- **There will be conflict**: with your advisor, with co-authors, with colleagues, with fellow graduate students, etc.

- Conflicts often arise in paper authorship and co-authorship. Your advisor will make some decisions, but you should also be involved.

- Try to determine a priori, to the extent possible, who will do what in a particular paper.

- Be generous with co-authorship, but not to the extent that you will not take sufficient credit for work that you did.

Dealing with conflict

▶ Conflicts will also arise with other researchers in the field: exactly who did what is a never ending question in science.

▶ Try to resolve such conflicts as **amicably** as possible: remember, if you are working in a hot area, there will be battles to be fought in order to get credit for your work!

▶ On the other hand, **don't be a pushover**: make sure that you take credit for work that you have done. If people don't cite your work, go out there, give talks and make sure that they are aware of it.

▶ Graduate students are often afraid of competition and try to "shield" their research from outsiders. This might lead to isolation and lack of interest from the broader community.

▶ Encourage other groups of researchers to work on problems relevant to your research area. You need followers in order to be visible and famous!

Congratulate yourself for successes!

▶ Failure is so common in research that we fail to properly **celebrate success**!

▶ **Causes for celebration:** solving the problem that was puzzling you for weeks or months, writing and submitting the paper presenting your solution, having your paper accepted in a conference/journal, presenting your paper, getting a summer internship, etc.

▶ I don't mean that you should order fireworks, champagne, caviar, and cigars whenever any of the above events happen.

  ▶ By all means, if you can afford it, please do and **invite me**.

Congratulate yourself for successes!

- It is often enough to just take a few minutes to **recognize your success** and congratulate yourself for a job well-done.

- If there were any important **lessons to be learned from your success**, note them down (physically, not mentally) on post-its and post them on your desk for a few days.

Enjoy graduate school!

▶ e-mail: drineas@gmail.com

▶ web page: http://www.cs.rpi.edu/~drinep/

▶ or google *drineas*

▶ **Questions?**