The Top 10 Lessons
I Learned as a Grad Student

... And One I Have Learned Since

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11. Sow Some Wild Oats

Don’t have to jump into thesis; take a few years to explore other areas (even completely unrelated ones)

*Provides good background & perspective*

*You might find something interesting*

*You might find related problems to solve*

*You might have fun*

*You will not get bored of your PhD topic quite as quickly as otherwise*
10. Extracurriculars: Do Them

Learn to play an instrument;
Play sports (contact & non-contact);
Learn a foreign language

*Being busy forces* prioritization & focus

Non-research activities are therapeutic
(especially contact sports)

*HOWEVER:* When you’re old & complaining about joints, you won’t play much football

Become an interesting person
9. Collaborate with Others

Most people see advisor once/week, but need feedback => COLLABORATION (it also gets the work done faster)

Bounce ideas off people

Finish research papers 2-3 times faster

Have someone to go to lunch with ... :)

Not easy to start late in the PhD process
8. Old vs. Young Advisor

OLDER ADVISOR:
Typically has more money, more students, more contacts, less time. Perhaps better job opportunities after graduation? Perhaps less direction?

YOUNGER ADVISOR:
Typically has less money, more energy, more time, fewer job contacts, less perspective. Perhaps more direction and personal interaction?
7. Job Market: PhD vs. MS

In Computer Engineering:

Ph.D. — Design
M.S. — Implementation
B.S. — Coffee-fetching

PhD’s are payed to *THINK*;
MS’s are payed to *DO*

PhD’s do not make MUCH more than MS’s

MS’s start making the money 2-5 years *early*
6. Read a Paper a Day*

Your job as a grad student is to ABSORB KNOWLEDGE like a SPONGE

Borrow & read textbooks

Read conference proceedings (good ones)

Read journals (good ones)

(For Computer Architecture:)
• Join ACM SIGARCH, SIGMICRO, SIGOPS
• Good research delivered to your door

* Thanks to Don Yeung
5. Do Excellent Research

Point of Research: ask & answer questions, NOT build & evaluate implementations

 Asking & answering questions is **SCIENCE**

 Building & evaluating implementations is **ENGINEERING**

 You will be remembered mainly for your contributions to **SCIENCE**
(there are many counterexamples, however)

 Look for & follow well-established assessment methodologies
4. Give Excellent Talks

Your presentation of ideas is how many will judge you, so do it well.

*Begin AT LEAST one month before date*

*Give a practice talk*
  
  *Take suggestions*
  
  *Rewrite the talk*
  
  *Repeat*

*Big fonts, diagrams wherever possible,*

*COLOR seems to work well*
3. Write Excellent Papers

Your presentation of ideas is how many will judge you, so do it well. Remember: your papers will last forever.

What papers do you cite frequently? What papers do you re-read? EMULATE THESE PAPERS

Aim high, but have fun (Banff, Ireland, etc.)

- Chance to travel on advisor’s tab
- Don’t do too many workshops (or if you do, don’t list them all)
2. The Point of the PhD

To push the boundaries of what we know
[ Requires looking at one topic in excruciating detail ]

RESULT: you can distinguish between what is known and what is not known—you are able to ask questions that are not answered

Your thesis will not save/conquer the world; you will be lucky if 10 people read it. DO THE MINIMUM NECESSARY.

Your research is disseminated through your papers, not your dissertation

Treat your dissertation like a BIG paper

That’s it.

If you try to conquer/save the world, you will graduate in roughly 15 years, or drop out in frustration
So ... What Have I Learned Since Grad School?
Don’t Expect the U.S. Legal System ...

WHAT AM I TALKING ABOUT?

• (Academic) Job Interviews
• Presentations at Conferences
• When People Read Your Papers

WHAT THEY THINK:

• Your Problem is Irrelevant/Uninteresting
• Your Problem is Easy to Solve
• Your Problem was Solved in the 1980’s by that Group at U. Whatever

(a little knowledge is a dangerous thing ... )
Easy Solution: Anticipation & Preparation

MOTIVATE YOUR WORK

- Demonstrate **RELEVANCE** of problem
- Show **DIFFICULTY** of problem
- Give examples: *CAN’T DO X WITHOUT Y*

DESCRIBE ALL RELATED WORK

- This is what **RESEARCH** is all about ...
- Why each is applicable/inapplicable
- Describe **non-solutions** as well
- Don’t get caught **FLAT-FOOTED**
In Review:

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10. Extracurriculars: Do Them
9. Collaborate with Others
8. Old vs. Young Advisor
7. Job Market: PhD v. MS
6. Read a Paper a Day
5. Do Excellent Research
4. Give Excellent Talks
3. Write Excellent Papers
2. The Point of the PhD
0. Anticipation & Preparation