Advice for PhD Students from the Graduate Advisor

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PART 1: Ten Keys to Success In Graduate School

Based on slides prepared by Matthew Turk
Your Success = Our Success

- The ranking of this department in ten years will be directly related to the quality of the work you do here as graduate students
  - Success of graduate students means success for faculty, undergraduates and staff!

- You can make the department better!
  - It is pretty good already, but there is always room for improvement
No Excuses, Great Opportunities

• You are at a research university in US
  – 17 of the world’s top 20 universities are in US
  – In computer science US is especially dominant
  – This is the place to be to do research in this area

• Computer Science is a very exciting and very young discipline
  – Has fundamental problems that are unsolved (e.g., $P =? NP$)
  – It can change the society (e.g., WWW)
  – Contributes to basic science (e.g., bioinformatics)
What is graduate school all about?

• The PhD process is an apprenticeship – not a job
  – You’re here to *accomplish* something and to *become* something

• It’s not like being an undergraduate student

• During your PhD
  – Most of what you learn comes outside of classes
    • “What’s on the exam” is not your main concern
  – Requires a different set of skills
  – *Results* count (not time, not effort)
No guarantees

• You need to contribute something *original*
  – This is why your advisor can never guarantee that you will graduate in a certain amount of time

• We will help you, but eventually you have to come up with some contribution that will deserve a PhD

• The great part is the contribution will be all *yours*!
  – So you will get all the credit (and the awards)
Evolution of a PhD Student

• Phase 1: You feel like you know a lot
  – You were very successful as an undergraduate and you did not find it very challenging

• Phase 2: You feel like you know nothing
  – You realize that undergraduate textbooks simplify things a lot, and there is whole lot more to learn

• Phase 3: You feel like maybe you can survive
  – You write a paper and it gets accepted

• Phase 4: You are an expert in a research area
  – You correct your advisor’s mistakes

You may go back and forth between phases 2 and 3 for a while.
How to Succeed in Graduate School

• 10 pieces of advice for success in graduate school
1. Manage Your Time

- **Goals, priorities, and planning**
  - Set goals
    - Make sure that you have subgoals that are achievable!
  - Make plans about how to reach your goals
    - Prioritize – do important things first
  - Don’t waste time
    - “Is this activity helping me to achieve my PhD?”
    - Choose activities which help you achieve more than one goal
  - Keep a notebook, write these things down
2. Develop intellectual discipline

• **Think!**
  – Set aside time for thinking. Really.

• **Read!**
  – Get to know the literature in your area intimately (not superficially, read the details, think about the skipped details, why did they skip them?)

• **Act!**
  – Don’t feel like you have to know everything first
  – Don’t worry about being wrong

• **Evaluate!**
  – Solicit feedback – most ideas aren’t so good…
3. Be proactive

• Don’t wait to be told what to do
  – Don’t be passive; in fact, be aggressive!
  – Make things happen

• You will not be spoon-fed
  – What you get out of graduate school is a non-linear function of what effort you put into it

• Graduate school can be very unstructured
  – Unlike law school or medical school
  – So it’s up to you (not your advisor)
4. Learn to communicate well

• Speaking
  – Communicate clearly
• Writing
  – Organization and clarity
  – Attention to detail!
• Presenting
  – Not just “talking,” but communicating

• TAship
  – A great opportunity for improving your communication skills, do not waste it!

Your intelligence and ideas will be judged by your ability to communicate in English
5. Develop an intellectual community

• Develop an intellectual community with your peers at UCSB and in other universities
  – Ask questions
  – Discuss ideas
  – Brainstorm
  – Argue, challenge
  – Collaborate

- Get to know the people in the department (faculty and grad students), and other people in your field
  - Don’t wait – introduce yourself!
- Go to conferences and meet other grad students and “famous” researchers
  - Be aggressive!
- Talk with visitors: “pick their pockets”
  - You never know who will someday offer you a job, write a reference letter, review your paper, give you invaluable feedback or insight....
7. Choose a good research problem

- This is the hardest, and most important, part of research!
  - A problem you can solve during your PhD, but not trivial
  - A problem your advisor knows something about
  - A problem that would not require you to get another degree in another discipline

- Actively search for a problem
  - Read, listen, ask

- The most important thing is:
  - Work on something you like!
8. Understand the faculty

• We are very busy.
  – That’s no excuse. We *do* have time for you.

• We know more than you do.
  – At least for a little while.
  – But not as much more as you might think.

• We are not superior beings.
  – Don’t be intimidated, express your ideas.
  – Give *us* feedback too!

• We are part mentor, part colleague, part human.
9. Study successful people

• Senior grad students, faculty, pioneers, leaders in your field, …
  – Read biographies
  – Who are your heroes, mentors?

• Seek advice
  – But modify it to your particular situation
10. Have a Life

- Work hard, schmooze, think, read, program, experiment, build, study, practice, ....
  - So little time and so much to do!!

- Still, amidst the chaos of graduate school, it is very important that you do not lose sight of who you are and what makes you tick.
  - Have a social life
  - Don’t neglect your family and friends, your health, your sanity
  - Do make time for things that are important and meaningful to you
More Advice

- Matthew Turk has a compilation of useful information and advice for graduate students:
  http://www.cs.ucsb.edu/~mturk/Students.html
PART 2: Advice on Finding a Research Advisor
Resources

• Courses
  – Great for establishing contact with faculty

• Faculty
  – Learn about their research, go talk to them

• Students
  – Talk to students who are RAs, learn about their research

• Departmental seminars, colloquia, MS/PhD exams
  – Attend them!

• Department webpages
  – Look at the research lab pages, papers
Courses

http://www.cs.ucsb.edu/courses/

- < 100: Lower division courses
- 100 level: Upper division courses
- 2xx level: Graduate courses
  - 290: special topics
- Others
  - 595: Group Studies/Seminar
  - 596: Directed Research
  - 501, 502: TA Training, TA Work
  - 597: “Exam” Preparation
  - 598: MS Thesis Research
  - 599: PhD Dissertation Research
Activities in the First One-to-Two Years of PhD

- Core Grad Courses
- Specialized Courses
- Research Project(s)
- Find Research Advisor
- Research
- Research
- Research
- Research
- Research
- Research
- Research
- Research
- Research
- Research
- 595s
Faculty Research Areas

http://www.cs.ucsb.edu/people/faculty/

- BioInformatics (Singh, Ibarra)
- Architecture (Chong, Sherwood, Krintz, Van Dam, Zheng)
- Database Systems (Agrawal, El Abbadi, Su, Singh)
- Foundations & Algorithms (Egecioglu, Gonzalez, Ibarra, Suri, Van Dam)
- Intelligent & Interactive Systems (Hollerer, Smith, Turk, Wang)
- Networking (Almeroth, Belding, Zhao, Zheng, Krintz, Suri)
- Operating Systems & Distributed Systems (Cappello, Wolski, Yang, Agrawal, El Abadi, Krintz, Singh, Zhao)
- Programming Languages & Software Engineering (Bultan, Krintz, Kemmerer, Sherwood, Su)
- Computational Science and Engineering (Gibou, Gilbert, Petzold, Yang)
- Security (Kemmerer, Kruegel, Vigna, Zhao)
Research Labs

http://www.cs.ucsb.edu/research/

- The Distributed Systems, Databases, and Bioinformatics Lab (DBL)
- Computer architecture lab (ArchLab)
- The Lab for Research on Adaptive Compilation Environments (RACELab)
- LINK: Lab for Intelligent Networking
- Database Systems Lab (DSL)
- Four Eyes Laboratory (Imaging, Interaction, and Innovative Interfaces)
- Computer Vision Research Laboratory
- Next Generation Networking Group (NG2)
- Networking and Multimedia Systems Lab (NMSL)
- Mobility Management and Networking (MOMENT) Lab
- CURRENT: Lab for Secure and Reliable Networking
- Verification Laboratory (VLab)
- Computer Security group
- Computer architecture lab (ArchLab)
- Combinatorial Scientific Computing Lab
- Computational Science and Engineering Lab
Attend Departmental Activities

- **Research Groups**
  - 595 seminars (including TA training in Fall and faculty research seminar in Winter)
- **Department Colloquia**
  - Distinguished Lecturers and other visitors
- **Presentations by Students**
  - MAE, Proposal, Dissertation, Project, Thesis
- **Graduate Student Association**
  - Get involved, serve in the departmental committees
- **Social Events**
  - Attend coffee hours, picnics/cookouts, etc.
- **Graduate Student Research Workshop in Fall**
- **Workshops and Conferences organized by Faculty**
  - Volunteer if you are interested in the area
Your Webpages!

• Faculty who are looking for RAs would like to
  – see your CVs
  – learn about your research interests

• Keep an up to date webpage at:
  – http://www.cs.ucsb.edu/~your-user-name
  – You can find lots of examples at:
    http://www.cs.ucsb.edu/people/graduate
HOMEWORK ASSIGNMENT

• Due March 4th

• Prepare your webpage and put it at:
  – http://www.cs.ucsb.edu/~your-user-name

• List the following in your webpage:
  – Your research interests
  – Your CV or resume
  – The courses you have taken at UCSB
  – Significant software projects you developed
  – Papers you have written
Sources of Advice/Information

- **Department webpages:** [http://www.cs.ucsb.edu/](http://www.cs.ucsb.edu/)