

Surviving Grad School When Your Advisor is *SAVAGE*

Enze “Alex” Liu

October 25, 2023

Motivation

- Grad school is **hard**

Motivation

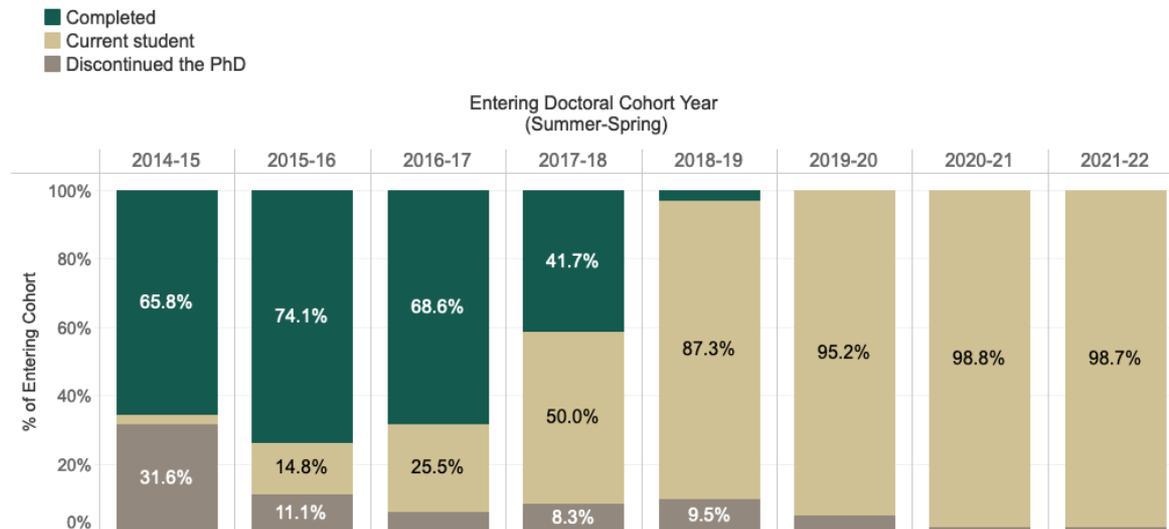
57.3% of Computer Science PhD students graduate in 6 years or less.

(Based on 143 students starting between Summer 2014 and Spring 2017)

6-year CS PhD
completion rate

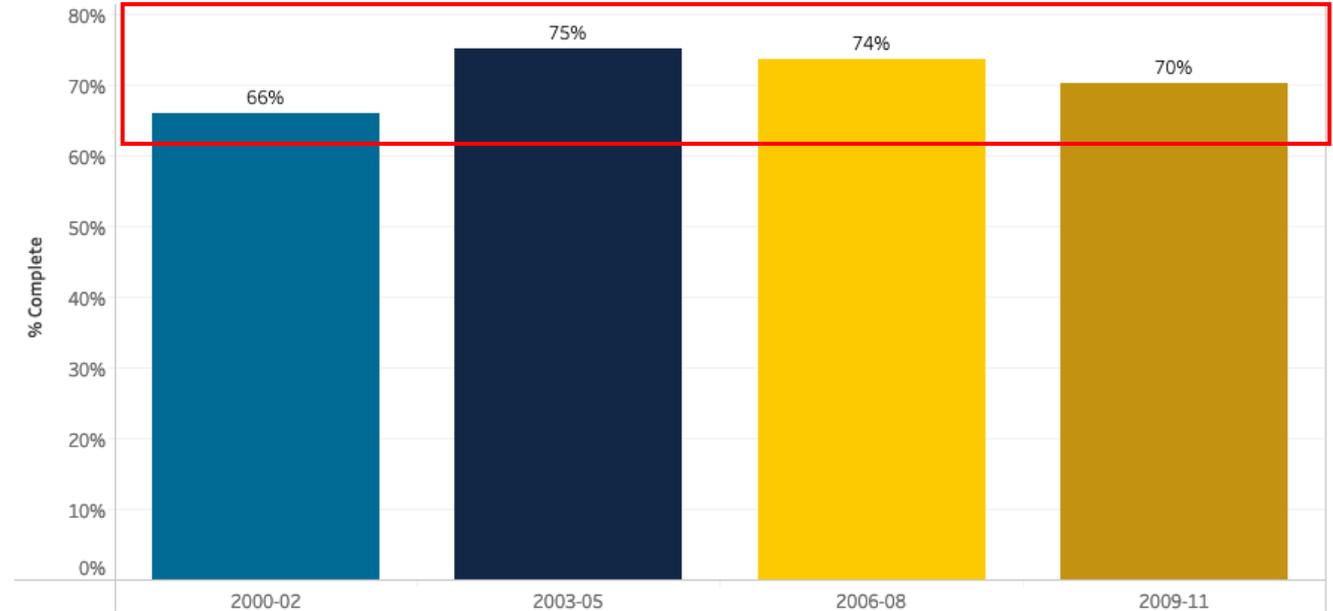
@ Stanford

What is the current status of Computer Science PhD students from each recent entering cohort?
(Updated December 2022)



Motivation

10-year CS PhD
completion rate
@ UCSD



Motivation



Motivation

- Grad school is hard
- **Personal interest**

Motivation

Grad School



Motivation

- Grad school is hard
- Personal interest
- **Lack of education (@UCSD)**

Motivation

Home

About Me

Research

Publication

Teaching

Resource

07/06/06

Bibliography Database:

- [NEC Research Index](#)
- [Germany Collection of CS Bibliography](#)
- [ACM Digital Library](#)

Conferences

How-to's for Graduate Students:

- [Advice on research and writing from CMU](#)
- [Graduate school advice from Berkeley](#)



What This Talk is About

- General advices (mixed w/ my personal stories)
- Grad students sharing experiences and lessons

!!! What happens here stays here !!!

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Ballgame

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Managing Your “Job”

Grad School is a Different Ballgame

*“Ph.D. Students Must Break Away From
Undergraduate Mentality”*

Grad School is a Different Ballgame

Undergraduate Degrees

- GPA/Classes matter
 - 4.0 is great
- **Semester-long** projects
- **Consumer** of knowledge
- **Teacher-student**

Ph.D. Degrees

- GPA/Classes don't matter
 - Reasonable GPA / Interesting classes
- **Year-long** projects
- **Producer** of knowledge
- **Apprenticeship**

References: [3,6,10,12]

Grad School is a Different Ballgame

Pros:

- Freedom
- Future opportunities
- Personal growth
- Ownership
- Status



Cons:

- Need a reason to finish
- Time-consuming
- Financially bad idea
- Stress
- Uncertainty

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You and Your Advisor

*“Being a Ph.D. advisor is a “tenured” position,
for life.”*

You and Your Advisor

What to look for in an advisor?

- Common Interest
- Reputation
- Research funding
- Advising students
 - Past & current students
- Advising style
- Research style
- Fair & reasonable
- Has an active group
- Active in research
- Have openings
- Working style
 - E.g., pressure you?
- Pre- or post- tenure
- And more!

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(My personal preference)

References: [19, 26, 27]

You and Your Advisor

Advising Students: Internet Archive

Geoff's page (2013)

phd students	Neha Chachra	Feng Lu
	Matt Der	Andreas Pitstillidis
	Tristan Halvorson	David Wang
	Do-kyum Kim	Qing Zhang
	He Liu	Gjergji Zyba

Geoff's page (2017)

phd students	Gautam Akiwate
	Lixiang Ao
	Sunjay Cauligi
	Louis DeKoven
	Ariana Mirian
ms students	Liz Izhikevich
phd students graduated	Neha Chachra (Winter 2016)
	Matt Der (Summer 2015)
	Tristan Halvorson (Summer 2015)
	He Liu (Winter 2015)
	Qing Zhang (Fall 2014)
	David Wang (Summer 2014)
	Do-kyum Kim (Summer 2014)
	Feng Lu (Summer 2014)
	Andreas Pitstillidis (Fall 2013)
	Gjergji Zyba (Spring 2013)

Everyone graduated!



You and Your Advisor

Manage your advisor

- Advisors are humans
- Understand your advisor
 - Strengths & Weaknesses
- Meet frequently
 - Weekly if possible
- Teach your advisor
- Take the initiative
- Ask for what you need
- Listen to your advisor (but not always)
- Bring results (and start with summary)

References: [2, 5, 6, 8, 11, 12]

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References: [2, 5, 6, 8, 11, 12]

You and Your Advisor



Your advisor's strengths

You and Your Advisor



Your advisor's strengths

You and Your Advisor

The   relationship:

- Evolve over time
- Highly personalized
- Extremely important

You and Your Advisor

The advisor-advisee relationship:



Incentives:

- The Dr. title
- Get a green card
- Find a partner

Responsibility:

- Do GOOD research
 - Source of ideas
 - Collaborations

References: [1, 3, 11, 22]

You and Your Advisor

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You and Your Advisor

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- Tenure
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- Reputation

Responsibility:

- Guidance
- Support
- Professional advocacy

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You and Your Advisor

What if it doesn't work out?

- Exit gracefully (if possible)
- Ask for help: early and broadly
 - Your peers
 - Other faculty members
- More: [25, 27]

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Research

*“Your research is the most important thing
for your (grad school) career”*

Research



Research

Read:

- Read a lot (but not all the details) & take notes
 - Recent top conferences
 - Follow references
 - Broadly
- Don't just read, THINK
- Develop your research taste

References: [2, 8, 12, 18, 24]

Research

Ideas: Requires lots of thinking (hard!)

- Patterns (aka shortcuts; use w/ caution):
 - Pain point
 - Fill in the blank
 - Have hammer want nail
 - External sources
 - More: [16, 18, 23, 24]

References: [16, 18, 23, 24]

Research

Ideas: Requires lots of thinking (hard!)

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Domain\Techniques	Static analysis	Dynamic analysis
Use-after-free		✓
Out-of-bounds access	✓	✓

References: [16, 18, 23, 24]

Research

Project (aka doing research):

- Give it your best time
- Make continuous progress (aka the daily grind)
- Maintain to-do lists & milestones
- Get feedback from peers & advisors
- Stay motivated & focused (but also stop if necessary)
- **Work with good, experienced researchers**

Senior folks whom I “worked” with

Collaborators



Advisory board



Senior folks whom I “worked” with

Collaborators



Advisory board



Senior folks whom I “worked” with

Collaborators



What you are working on seems publishable and you should write it up
→ my imc 21 paper



Advisory board



Research

Publish: Writing & Presenting

- Many good advices exist (e.g., [14])
- **Practice makes perfect**
 - I did 8 syslunch talks over 13 quarters
 - Topics ranging from password to Android to email to finance
 - Take the opportunity when you can

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“Maintain Sanity”

Managing Your “Job”

- Work
- Work-Life Balance
- Individual Development
- Non-technical Aspects of Grad School
- Social Dimensions

Managing Your “Job”

Work

- Work hard
- Love of the work: love of using/practicing your skill
- The hours (“50% RA != 20hrs per week”)
 - 65-70 hrs/week [6] and every day [11]

Managing Your “Job”

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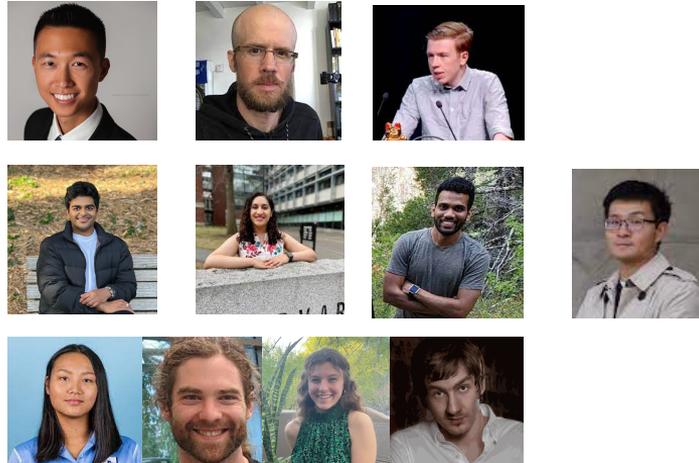
Managing Your “Job”

Working hours of residents of 3140



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Managing Your “Job”

Working hours of residents of 3140



“At ETH we work from 8 to 5”



Managing Your “Job”

3140 is doing just great (without crazy hours):

- S&P 23 distinguished paper*
- Crypto 23 best paper
- EuroS&P 23 best paper
- PKC 23 best paper
- eCrime 22 best student paper
- Applied Networking Research Prize 22
- NSF GRFP 22
- Meta fellowship 22
- Applied Networking Research Prize 21
- TMA 21 best paper

*Published by Miro

Managing Your “Job”

Work-Life Balance

- Stay healthy and sane
- Have hobbies and interests
 - Don't camp in the office
- Seek help if you need it / don't wait for help to come

Managing Your “Job”

Individual Development

- Organizational skills
- Take initiative
- Communication skills
- Tenacity
- Interpersonal skills
- Sick skin
- Dedication
- And much more

References: [7, 15]

Managing Your “Job”

Non-technical Aspects of Grad School

- Conferences
- Networking (e.g., invited talks)
- Be your own advocate

Managing Your “Job”

Non-technical Aspects of Grad School

- Conferences
- Networking (e.g., **invited talks**)
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Managing Your “Job”

Social Dimensions

- Be part of a community (research group, GradWic, CSE, etc.,)
- Be part of the research community
- Make friends (office, CSE, other departments, and univs)
 - Your friends are your support network

Managing Your “Job”

The “Friends” Papers of 3140

Limited Access: The Truth Behind Far Memory

Anil Yelam*, Stewart Grant*, Enze Liu, Radhika Niranjana Mysore[†],

Marc **An Empirical Analysis on the Use and Reporting of
National Security Letters**

ALEX BELLON, UC San Diego, USA

MIRO HALLER, UC San Diego, USA

ANDREY LABUNETS, UC San Diego, USA

ENZE LIU, UC San Diego, USA

STEFAN SAVAGE*, UC San Diego, USA

“students...who are more engaged with other students... often
graduate sooner...” -- Jennifer Rexford

Limitations

- Luck is part of the equation [29] (yet it favors the prepared mind)
- A collection of biased advices from faculty members
 - A grad student's perspective [28]
- My biased stories (blame my advisors/peers/friends)
 - Be careful about taking advice from senior students, especially forums [19]
- Many aspects I didn't cover (selection bias)

Summary: Dos and Don'ts

Summary: Dos and Don'ts

- Take interesting classes
- Start doing research early
- Know & manage your advisor(s)
- Read & think
- Work hard & stay focused
- Practice (everything)
- Have a life, friends, & stay sane
- Too focused on classes/GPA
- Try to finish literature review
- Don't trust your advisor(s)
- Passive reading
- Don't have a goal
- Don't polish writing/talks
- Live in the lab

"I hope you all will graduate!" --- Alex Liu

References

- [1] A Survival Guide to a PhD
- [2] How to Be a Successful PhD Student
- [3] How to get started on research in graduate school
- [4] 10 easy ways to fail a Ph.D.
- [5] Managing Your Advisor
- [6] How to Have a Bad Career in Research/Academia
- [7] So long, and thanks for the Ph.D.!
- [8] The Graduate Student Survival Guide
- [9] You and Your Research
- [10] Ph.D. Students Must Break Away From Undergraduate Mentality
- [11] Advice for early-stage Ph.D. students
- [12] Graduate School: Keys To Success
- [13] Productivity tips, tricks and hacks for academics

References (cont.)

- [14] [Storytelling 101: Writing Tips for Academics](#)
- [15] [Advice for New Graduate Students](#)
- [16] [Research Projects are Like Fractals](#)
- [17] [Hints for research students](#)
- [18] [Useful Thoughts about Research](#)
- [19] [Graduate Study in the Computer and Mathematical Sciences: A Survival Manual](#)
- [20] [How to Have a Bad Career as a Stanford Graduate Student](#)
- [21] [How to Succeed in Graduate School: A Guide for Students and Advisors](#)
- [22] [How Is Your Advisor/Advisee Relationship?](#)
- [23] [Research Patterns](#)
- [24] [How to Look for Ideas in Computer Science Research](#)
- [25] [My Advisor is a Monster \(What Do I Do?\)](#)

References (cont.)

- [26] How To Survive as a Graduate Student
- [27] How to survive as a grad student (comment)
- [28] Highly Opinionated Advice for (CS) PhD Happiness
- [29] The role of luck in academia

Also available at: https://alexliu0809.github.io/useful_links/#/

My Truly Great Academic Parents



Geoff Voelker



Stefan Savage

Surviving Grad School When Your Advisor is Savage

Enze “Alex” Liu

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🌐 e7liu.github.io

“Your students are your legacy”

David Patterson, CACM, March 2009