

CS Tips

Personal Character

- The personal character of programmers has received only a little attention
 - Dijkstra, 1965: “Programming Considered as a Human Activity”
 - Weinberg, 1971: “The Psychology of Computer Programming”
- But this should receive more attention
 - Electrical Engineer: Knowledge of circuits, conductivity, how to use an oscilloscope, etc.
 - Software Engineer: Primary tool is YOU to design and construct the system

Personal Character Off Topic?

- Inwardness of programming makes personal character especially important
 - Ever program at odd hours? Burned out?
 - Programming work is mostly unsupervisable because nobody really knows what you're working on unless looking over your shoulder all day
 - Often employer not in a position to judge if you're good, it's up to you to be responsible to be good or great
 - Character makes a difference; if you can't change your intelligence at least you can change your character!

You don't have to be super intelligent?

- Nobody is really smart enough to understand everything
- Dijkstra, Turing Award Lecture, 1972. "The Humble Programmer"
 - Most programming compensates for limited size of stuff in our skulls
 - Best programmers realize how small their brains are; they are humble
 - Worst programmers refuse to accept that their brains aren't equal to the task; egos keep them from being great programmers
 - The more you learn to compensate for your small brain, the better programmer you will be and the more humble you are the faster you will improve

Compensation Examples

- Decomposing a system
 - Makes it easier for humans to comprehend, whether structured, top-down, or object-oriented
- Conducting reviews, inspections, tests compensates for human fallibilities
 - Originated as part of “egoless” programming
- Keeping routines short helps reduce mental workload
- Using conventions can help free your brain from relatively mundane aspects of coding
- The humble programmers who compensate for their fallibilities write code that’s easier for themselves and others to understand and with fewer errors.

Curiosity

- Ok, so hopefully you admit your brain is too small to understand most programs and you need a way to compensate...
- Curiosity about technical subjects is a must to become a superior programmer
- Technical environment changes every 5-10 years, if you aren’t curious to keep up with the changes you will go the way of COBOL and punch cards

Actions to exercise curiosity

- Build your awareness of the development process
 - From reading, own observations
- Experiment
 - With development process and coding, write tests for new concepts, execute in debugger
- Analyze and plan before you act
- Learn about successful projects (or why projects were unsuccessful)
 - Rarely done, most people wouldn't use their recreational time to scrutinize long code listings that work (or don't work)
 - But engineers study the Tacoma Narrows bridge, or architects study Frank Lloyd Wright
- Read manuals, books, periodicals

Intellectual Honesty

- Maturing as a programming professional is developing an uncompromising sense of intellectual honesty. Examples:
 - Refusing to pretend you're an expert when you're not
 - Admitting your mistakes
 - Trying to understand a compiler warning rather than suppressing the message
 - Clearly understand your program – not compiling to see if it works
 - Provide realistic status reports
 - Provide realistic schedule estimates and holding your ground when management asks you to change them (or tricking management to win a project).

Communication and Cooperation

- Truly excellent programmers learn how to work and play with others
 - This includes writing readable code
- Most good programmers enjoy making programs readable, given enough time, although there are a few holdouts
 - Level 1: Beginner
 - Capable of using basic capabilities, e.g. loops, conditionals, write routines
 - Level 2: Intermediate
 - Capable of basic routines of multiple languages
 - Level 3: Specialist
 - Expertise in a language or environment or both, many stuck here
 - Level 4: Guru
 - Level 3 plus recognizes 85% of programming is communicating with other people
 - Only 30% of an programmer's time is spent working alone, on average
 - Guru writes crystal clear code, documents it, results in guru status

Creativity and Discipline

- “When I got out of school, I thought I was the best programmer in the world. I could write an unbeatable tic-tac-toe program, use five different computer languages, and create 1000 line programs that WORKED. Then I got out into the Real World. My first task was to read and understand a 200,000 line Fortran program, then speed it up by a factor of two. Any Real Programmer will tell you that all the structured coding in the world won't help you solve a problem like that – it takes actual talent.”
 - “Real Programmers Don't Write Pascal”

Creativity and Discipline

- Tools and methods to emphasize human discipline (e.g. standards, conventions) have been especially effective
 - 15 year NASA study, 1990
- Highly creative people can still have discipline
 - Myth that discipline stifles creativity
 - Michelangelo divided the Sistine Chapel into symmetric collections of geometric forms, zones corresponding to Platonic stages. Self-imposed structure for human figures
 - Software engineers can impose similar discipline for requirements, design, testing

Laziness

- Laziness manifests itself in several ways
 - Deferring an unpleasant task
 - E.g. defer data entry, futz on other items first
 - True laziness
 - Doing an unpleasant task quickly to get it out of the way
 - Enlightened laziness – spending smallest possible time on something unpleasant
 - Writing a tool to do the unpleasant task so you never have to do the task again
 - Most productive if you ultimately save time, long-term laziness
- Don't mask laziness as "hustle" or just doing something to look busy

Characteristics that don't matter as much as you think

- Persistence
 - Depending on the situation, can be an asset or a liability
 - Stuck on a new piece of code: hardly ever a virtue, try redesigning or try an alternative approach, or come back later
 - Good idea to take a break if no progress after 15 minutes
 - Hard to know when to give up but it's essential that you ask

Characteristics that don't matter as much as you think

- Experience
 - Value of hands-on experience compared to book learning is smaller in software development compared to many other fields
 - Basic knowledge changes rapidly in SW Dev
 - Coding habits effective for COBOL not necessarily effective for Java
 - Easy to draw wrong conclusion from experience
 - “Five years of C++” not a big differentiator from a couple of years of C++, another three years makes little difference
 - Advantage goes to the young, hungry programmer!

Characteristics that don't matter as much as you think

- Gonzo Programming
 - “If you haven't spent at least a month working on the same program – working 16 hours a day, dreaming about it during the remaining 8 hours of restless sleep, working several nights straight through trying to eliminate that “one last bug” from the program – then you haven't really written a complicated computer program. And you may not have the sense that there is something exhilarating about programming.”
 - Edward Yourden
 - Tribute to programming machismo is bunk and even a recipe for failure. May help your ego but how about the time spent fixing all the bugs you wrote during those all nighters?

Habits

- Do you use a version control system for all your projects?
 - Maybe you did not learn about VCS until later so your habit is to just make a project on your local machine
 - Once habits are learned, they are hard to break or question
- Examples
 - Adding comments to the code?
 - You're looking for ways to make code readable, or fast, or you're not
 - You're regularly testing code incrementally as changes are made
- When you learn something new, it will be to your benefit to learn it the right way so it becomes an easy good habit instead of a bad habit

Job Advice

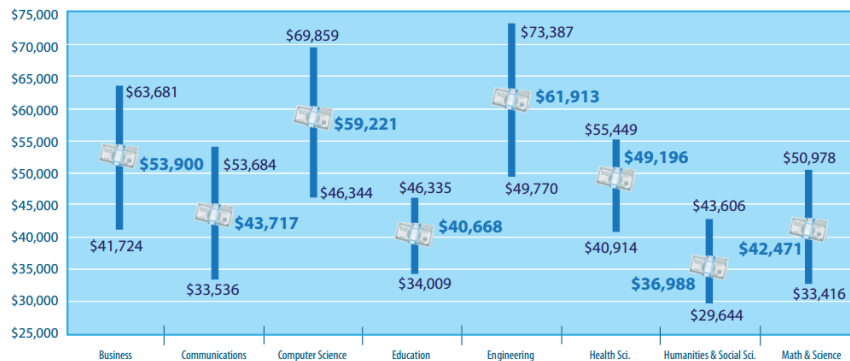
- Still CS jobs out there at decent salaries
- National Association of Colleges and Employers (NACE)

FIGURE 1 | **AVERAGE SALARIES BY DISCIPLINE**

Broad Category	2012 Average Salary	2011 Average Salary	Percent Change
Business	\$53,900	\$51,708	4.2%
Communications	\$43,717	\$41,988	4.1%
Computer Science	\$59,221	\$57,046	3.8%
Education	\$40,668	\$38,581	5.4%
Engineering	\$61,913	\$59,591	3.9%
Health Sciences	\$49,196	\$47,336	3.9%
Humanities & Social Sciences	\$36,988	\$36,252	2.0%
Math & Sciences	\$42,471	\$41,370	2.7%
Overall	\$44,455	\$42,987	3.4%

NACE Salary Survey

FIGURE 2 | **SALARY RANGES | BY DISCIPLINE**



24. Programmer Analyst

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Median pay: \$77,100

Top pay: \$107,000

10-year job growth: 22.1%

Total jobs*: 544,400

What they do all day? Clients depend on programmer analysts (aka: coders) to execute digital applications and databases from start to finish. They write code and create web designs and software, as well as work with designers and content producers to form a cohesive product. -- J.A.



PHOTO: THINKSTOCK

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	C	B

23. Systems Developer

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Median pay: \$94,600

Top pay: \$131,000

10-year job growth: 24.6%

Total jobs*: 3,426,000

What they do all day? Systems developers can sit in front of a computer for hours on end, writing the code used to create operating systems and other programs. They also test and debug all kinds of software and security systems to keep everything efficient and user-friendly. --J.A.

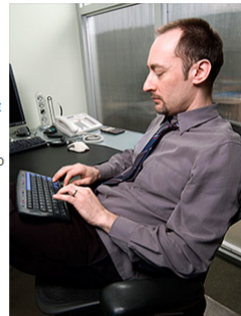


PHOTO: THINKSTOCK

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	C	B

15. IT Security Consultant

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Median pay: \$102,000

Top pay: \$156,000

10-year job growth: 27.8%

Total jobs*: 347,200

What they do all day? Corporate America's information explosion has also attracted no end of crooks looking to exploit it. Security consultants are hired data cops, brought in to find the weak spots in a company's IT system and figure out the best way to defend it from attacks and theft.

How to get the job? Consultants need a wide range of knowledge across networks, databases and all the latest weapons against viruses, Trojan horses and denial of service attacks. This is one job where hands-on experience really counts -- some of the top security experts are former hackers themselves.

What makes it great? The IT world will always need good cops. Plus there's the enormous satisfaction of keeping the bad guys out and keeping data safe.

What's the catch? It's a constant game of cat and mouse. As fast as security experts can figure out ways to block intruders, hackers come up with a whole new bag of tricks. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	B	B



PHOTO: THINKSTOCK

14. IT Network Engineer

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Median pay: \$73,400

Top pay: \$104,000

10-year job growth: 27.8%

Total jobs*: 347,200

What they do all day? They are the plumbers of the computer world. Network engineers design and install the high-tech pipes that keep information flowing and then stick around to fix leaks and clogs. A network can be as small as a company's intranet or as big as the World Wide Web.

How to get the job? A college degree is a good start, but this is the kind of job where knowledge is gained hands-on through experience. It requires the foresight of a chess player to see how one change in a system will affect operations 10 steps down the chain.

What makes it great? Like the other tech jobs on our list, network engineers are riding high on the data boom. Positions are out there for qualified professionals along with the opportunity for rapid advancement.

What's the catch? Since most networks get their heaviest use during business hours, maintenance and upgrades often have to be done during odd times. Be prepared to clock in after everyone else has gone home. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	B	B



PHOTO: THINKSTOCK

13. IT Consultant

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Median pay: \$96,400
Top pay: \$156,000
10-year job growth: 22.1%
Total jobs*: 544,400

What they do all day? Companies from startups to the Fortune 500 hire information technology consultants to figure out the fastest, cheapest and most reliable ways to make their computer systems run better. They assess a firm's tech needs, create a plan, see it through and follow up to make sure it's running well.



PHOTO: THINKSTOCK

How to get the job? The single-most important piece of advice for IT consultants is this: Specialize. Information technology covers a wide swath of categories -- hardware, software, networks, Web design, communications, to name just a few. A successful consultant will find a niche and let experience do the talking.

What makes it great? Even big businesses know that high-level tech issues can be a Pandora's box of trouble. A sharp IT consultant with the right specialty will command a premium rate and solve a company's problems -- ensuring future work down the road.

What's the catch? Specialization can feel limiting, but consistency pays off. Spreading oneself too thin can ruin a good reference, and references are the lifeblood of consultants. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	C	B

9. Software Developer

9 of 100

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3

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Median pay: \$84,200
Top pay: \$121,000
10-year job growth: 24.6%
Total jobs*: 3,426,000

What they do all day? From the games in a smartphone to the tools that map a genome, software developers write the programs that run our lives. The work runs across all levels of the process -- research, design, writing and testing -- and all the way to the final product.



PHOTO: JOHN R. COUGHLIN/CNNMONEY

How to get the job? Most developers have some sort of degree in computer science, but it's a field that welcomes self-starters with practical experience and the right certifications. Check with local colleges to get going.

What makes it great? A developer can fly solo as a freelancer or work for a company as part of a team. And with a technology boom that sees no end in sight, firms are having a hard time filling positions.

What's the catch? Those positions aren't always in the U.S. In the search for talent (and to cut costs), more companies are heading overseas for their development needs. It's also an ever-evolving field that requires a constant keeping up on what's new. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	B	C	B

5. Database Administrator

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Median pay: \$87,200**Top pay:** \$122,000**10-year job growth:** 30.6%**Total jobs:** 110,800

What they do all day? It's no understatement to say that corporate America is in the middle of an information explosion. Somebody has to keep track of it all. A database administrator (DBA) minds all the data in a company's storehouse, keeps it safe and makes sure it's easily accessible.



PHOTO: THINKSTOCK

How to get the job? A degree in computer science is recommended, followed by years of experience. Many employers require certification in the most widely used programs, including MySQL, Oracle and DB2. And since the technology is always changing, re-training is a constant.

What makes it great? More data means more opportunities — DBAs are among the top-growing jobs on our list. They also command high paychecks, compared even to other tech jobs.

What's the catch? The job requires long periods in front of the computer — especially during crunch times for big projects. And computers crash. Be prepared to come in late at night or on weekends when things go wrong. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	C	B

3. Software Architect

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Median pay: \$119,000**Top pay:** \$162,000**10-year job growth:** 24.6%**Total jobs:** 3,426,000

What they do all day? Great software architects are designers and diplomats. They create innovative and valuable programs, but they also translate highly technical plans into a vision the C-suite can understand. They are a crucial link between a company's tech unit and management.



PHOTO: THINKSTOCK

How to get the job? Unless one's last name is Gates or Zuckerberg, a computer-related degree is strongly advised. A high-level position, it requires lots of experience, technical smarts and fluid communication skills.

What makes it great? It's an opportunity to create and shape a company's computer strategy. More responsibility also brings higher pay for a designer who wants to trade a PC screen for the conference room.

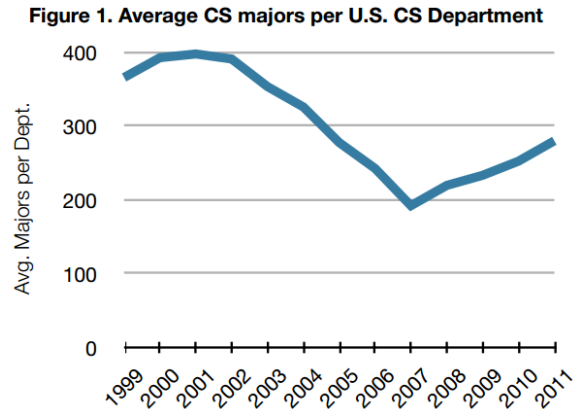
What's the catch? Tech teams and management often speak very different languages that can lead to misunderstandings and even flare-ups. Putting out fires on both sides is crucial. --T.Z.

Quality of life ratings:

Personal satisfaction	Low stress	Benefit to society	Flexibility
B	C	C	A

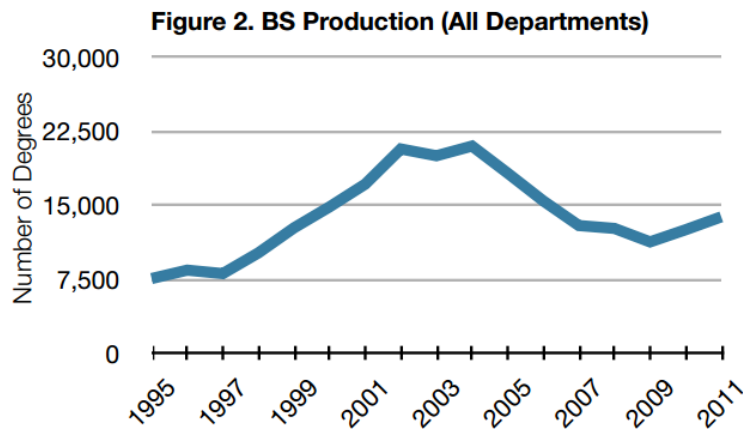
Supply of CS Grads Trending Up

- www.cra.org/statistics



Supply of CS Grads Trending Up

- www.cra.org/statistics



Job Seeking Advice

- Regularly update your resume
- Internet presence
 - Employers will google you, build a web page
 - Could include projects you've worked on, e.g. expose your senior project
 - Postings to mailing lists, discussion boards
- Learn a hot technology
 - Helps marketability, bot resume searches, e.g. Hibernate, AJAX, etc.
- Learn a hot methodology
 - E.g. Agile Development Methodologies

Job Seeking Advice

- Pitch in on an open source project
 - Tons of projects out there looking for programmers
 - www.sourceforge.net, www.freshmeat.net
- Statistically, big companies pay more but don't forget the little companies or freelance work
- Learn to use software tools
 - Version control, IDE, bug trackers, profilers

Job Seeking Advice

- Read every day about the field
 - Tons of programming and technology based mailing lists, news services
- Write some code every day
 - Or your skills will decline
- Build and rely on your network of people
 - Ask for help and give help when you can
- If invited for an interview, do your homework
 - Common interview questions
<http://maxnoy.com/interviews.html>
<http://dev.fyicenter.com/interview/>
 - Research the firm, generate questions

Or..... there's Graduate School

- MBA
 - Good choice to help move up the corporate ladder, particularly into management
- MS
 - Good choice for technical path, potential for management, higher starting salary
- Ph.D.
 - Potentially highest starting salary but fewer career choices

Grad school is not for everyone

- Plenty of smart people go right to industry
 - Learn on the job
 - Advance within company or hop jobs
 - Entrepreneurs cannot afford to wait
- For some, grad school provides
 - Personal goal to go as far as possible in a degree
 - A fast track to a job (faster than working your way up)
 - Unique opportunities (no other way to be professor)
 - A great opportunity to focus
 - Hopefully not a way to one-up your peers on the resume (degree as status symbol)

What is Graduate School Like?

- A professor's perspective...
 - At research universities, the professor runs a small company
 - Product: Invents and develops long-range research
 - Customer: typically Federal Government (National Science Foundation, Defense Advanced Research Projects Agency – DARPA)
 - Annual Revenue: \$300,000 - \$1,000,000
 - Employees: Grad students
 - At teaching universities, the professor manages a small department
 - Grad students often help teach courses
 - Most time spent teaching courses, performing university service (committees, curriculum, etc.)
 - Some of the research university activities but at a smaller scale

What is Graduate School Like?

- M.S. Degree
 - 1.5 - 3 years
 - Coursework similar to senior-level undergraduate courses
 - Usually provided an opportunity to specialize
 - Can easily start degree without selecting area of focus
 - Good schools provide opportunity to take many focused courses in your favorite area
 - Research (in form of thesis) may be required
 - Can sometimes just take courses or take an exam
 - Tuition and stipend are possible
 - (full tuition + \$15k / 9 mos + summer job)

What is Graduate School Like?

- Ph.D. Degree
 - 4 - 7 years
 - Usually require a Master's Degree first but some allow entry to the Ph.D. straight from a Bachelor's
 - Similar coursework to Master's Degree plus seminars and courses related to research
 - Usually must pass Ph.D. qualifying exam
 - Research required
 - Tuition and stipend scholarships are standard
 - (\$15k / 9 mos + some summer jobs)
 - Required to specialize
 - Helpful to know research interests from day one to expedite selection of research focus
 - Research focus often included in application letter

Is Graduate School for You?

- What are your career goals?
 - Sick and tired of school
 - Learn on the job (job hopping)
 - Entrepreneur
 - Technology management (manage engineers)
 - Professor

Is Graduate School for You?

- Do you enjoy learning - becoming an expert?
 - PhD makes you world's expert in *foo*
- Do you like being a big fish in a small pond?
 - Question applies to job and school options
- Do you prefer constancy or change?
 - Higher degrees are entree to management and provide you with more control
- Financial and family situation

Is Graduate School for You?

- Degree pros and cons
 - Bachelor's Degree
 - Good starting salary (\$40-\$60k) but peaks early
 - More job openings
 - Opportunity to swap jobs or move to management
 - But many jobs are entry level
 - Less control of day-to-day tasks
 - Employer usually benefits from not promoting you
 - May become bored – have to hop jobs

Is Graduate School for You?

- Master's Degree Benefits
 - Better starting salary (\$50k and up)
 - Many job openings
 - Potential to start at management level
 - Opportunity to swap jobs
 - More control of day-to-day tasks

Is Graduate School for You?

- Master's Degree Cons
 - Often still not in charge of project
 - 1.5 - 3 years of lost wages (less if paid during school)
 - More school, might do just as well learning on the job
 - May become frustrated by poor employees and lack of support from upper-level management

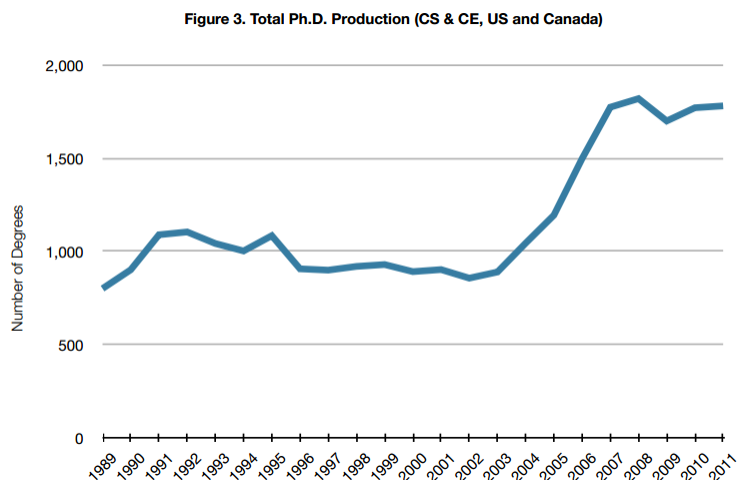
Is Graduate School for You?

- Ph.D. Degree Benefits
 - Potentially higher starting salary (\$50k+)
 - Large amount of control over work
 - Opportunity to teach in a university or community college
 - Management skills assumed
 - You'll be an expert in _____

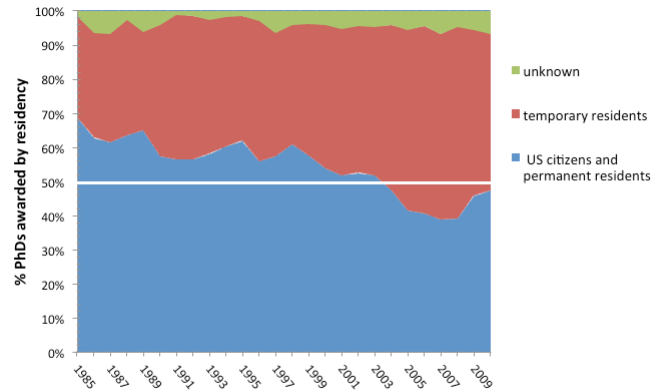
Is Graduate School for You?

- Ph.D. Degree Cons
 - Completing Ph.D. dissertation can be stressful
 - 3 - 5 years of income beyond the masters is lost
 - Overqualified to make large jumps between fields
 - It's a lot of hard work with few career options

Ph.D. Production Way Up

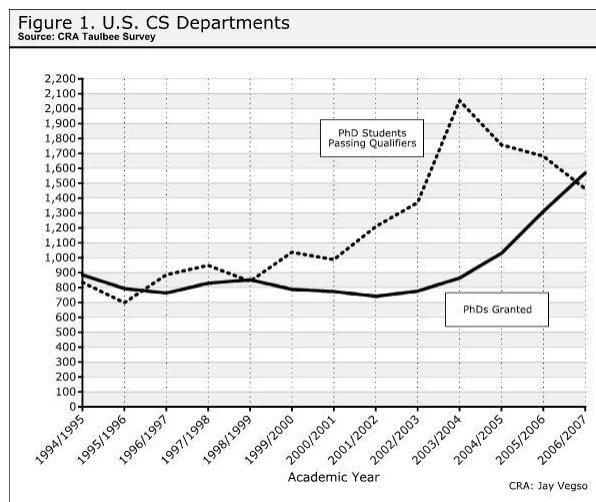


CS Ph.D's by Residency

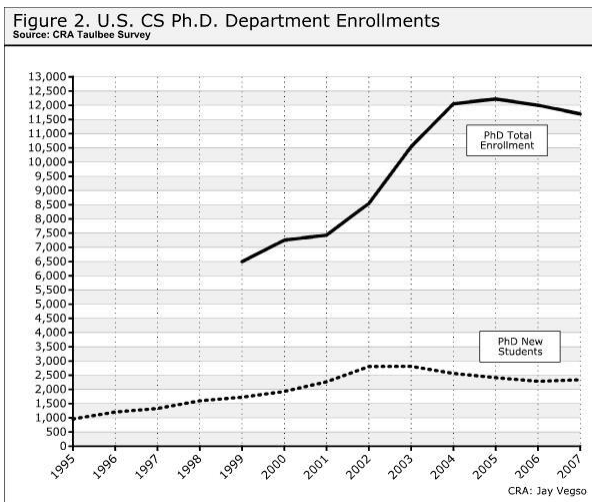


Source: National Science Foundation (<http://webcaspar.nsf.gov> and <http://ncses.norg.org/NSFTabEngine>)

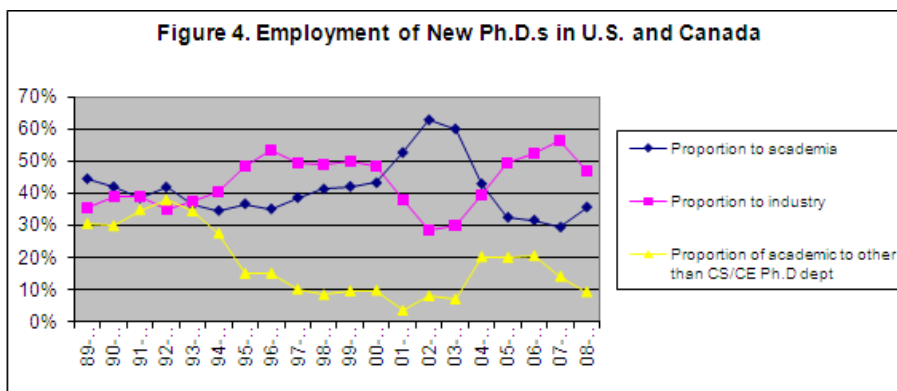
Ph.D. Pipeline



Ph.D. Pipeline



Where do Ph.D.'s Work



How Do I Apply?

- Application packet generally consists of the following
 - Transcript
 - Important, but not much you can do about this now...
 - Letters of Recommendation
 - Important – make or break marginal cases
 - Establish relationships with professors, one might be from employer
 - Personal Statement
 - Somewhat important – think about what you like
 - GREs
 - Somewhat important - subject test is hard, but many do poorly.
 - Research
 - It helps if you have worked on a research project as an undergraduate to show that you can do research as a graduate student

How Do I Apply?

- Transcript
 - Your school's reputation,
 - your grades
 - and your courses will speak for themselves
- Schools are sympathetic to GPAs that improve over time and weaknesses in outside areas

How Do I Apply?

- Letters of Recommendation
 - These carry a great amount of weight
 - Help your letter writer by reminding him/her of significant interactions you have had
 - Help your letter writer by sharing your research interests so he/she may find ways to write a letter that complements your personal statement

How Do I Apply?

- Contact person at other school sometimes helpful
 - This is very difficult
 - Best if you meet at a conference or other professional venue
 - Us profs get many such emails from foreign students
 - Don't sound desperate
 - Ask a reasonable question about the professor's research – showcase your qualifications

How Do I Apply?

- Personal Statement
 - This is a great opportunity to stand out
 - Research the schools in which you are interested
 - Ask professors to explain research areas
 - Try to sound like a student with experience, focus, and initiative
 - Don't limit your choices by writing something that makes you sound too focused (unless you are)

How Do I Apply?

- GRE's
 - General test always required
 - General test is like SAT's but slightly harder
 - Subject test sometimes required
 - Subject test is very detail oriented
 - Study! Purchase old tests/books for practice!

Where Do I Apply

- US News and World Report Top 50
 - Try not to worry about the money
 - Most schools have similar packages for their students. Those who want funding can usually find it.
 - Try to upgrade
 - CS Grad School List

Computer Science			
Ranked in 2010			
Computer Science Rankings Methodology			
Specialty <input type="text" value="Select One"/>			
Save	Rank	College name	Score
<input type="checkbox"/>	#1	Carnegie Mellon University Pittsburgh, PA	5.0
<input type="checkbox"/>	#1	Massachusetts Institute of Technology Cambridge, MA	5.0
<input type="checkbox"/>	#1	Stanford University Stanford, CA	5.0
<input type="checkbox"/>	#1	University of California--Berkeley Berkeley, CA	5.0
<input type="checkbox"/>	#5	Cornell University Ithaca, NY	4.6
<input type="checkbox"/>	#5	University of Illinois--Urbana-Champaign Urbana, IL	4.6
<input type="checkbox"/>	#7	University of Washington Seattle, WA	4.5
<input type="checkbox"/>	#8	Princeton University Princeton, NJ	4.4
<input type="checkbox"/>	#8	University of Texas--Austin Austin, TX	4.4
<input type="checkbox"/>	#10	Georgia Institute of Technology Atlanta, GA	4.3

#11	California Institute of Technology	4.2	#20	Yale University	3.7
#11	University of Wisconsin--Madison	4.2	#27	Duke University	3.6
#13	University of Michigan--Ann Arbor	4.1	#28	Johns Hopkins University	3.4
#14	University of California--Los Angeles	4.0	#28	New York University	3.4
#14	University of California--San Diego	4.0	#28	Ohio State University	3.4
#14	University of Maryland--College Park	4.0	#28	Pennsylvania State University--University Park	3.4
#17	Columbia University	3.9	#28	Rutgers, the State University of New Jersey--New Brunswick	3.4
#17	Harvard University	3.9	#28	University of California--Irvine	3.4
#17	University of Pennsylvania	3.9	#28	University of Virginia	3.4
#20	Brown University	3.7	#35	Northwestern University	3.3
#20	Purdue University--West Lafayette	3.7	#35	University of California--Santa Barbara	3.3
#20	Rice University	3.7	#35	University of Chicago	3.3
#20	University of Massachusetts--Amherst	3.7	#35	University of Minnesota--Twin Cities	3.3
#20	University of North Carolina--Chapel Hill	3.7	#39	University of California--Davis	3.2
#20	University of Southern California	3.7	#39	University of Colorado--Boulder	3.2
			#39	University of Florida	3.2
			#39	University of Utah	3.2

Soapbox (Kenrick's Opinion)

- A Master's Degree is most flexible
 - On average you'll earn more over your lifetime with a MS than with a BS or perhaps even a Ph.D.
 - You'll have more control over your day to day tasks and have a leg up in management
- Only get the Ph.D. if you are strongly compelled to get what it provides
- Don't go to work and think you'll come back to school – it's too hard and almost never happens
- Always remember to consider cost of living adjustments when comparing salaries
 - Silicon Valley is expensive

Special Case

- Get employer-paid M.S. while working
 - Consider quality of school
 - If you weren't working, is a better school possible?
 - A MBA degree from UAA might not be worth much to you if you are capable of Harvard (won't open doors)
 - Difficult to work and study – but you're young and might not have time commitments
 - Consider that school will likely pay you too if working on a research grant

Conclusion

- Lots of opportunities for CS majors today
 - Job market
 - Graduate school
- If you make it big don't forget that a nice donation will result in a UAA building named after you