



Computer Science Graduate Study and Other Careers

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REU 2019

Outline

- STEM
- Computer Science Career:
 - Employment Status
 - Outlook: Shortage of STEM worker
- Graduate Study
 - Is it for me?
 - Academic Careers and Others
 - Selecting a Program for You
 - Paying for the Graduate Program

College is the best Investment



College is the best investment

- There are 7,800 higher education institutions in the U.S.
- The Pew Research Centre finds that employed college graduates aged 25-32 earn **63%** more than those with only high-school degrees.

1. STEM

- STEM stands for **S**cience, **T**echnology, **E**ngineering and **M**ath education.
- While computer science has never been a part of the actual acronym, it was thought to fall under the technology category.

STEM + C

- On October 8th, 2015, President Obama has officially signed the STEM Education Act of 2015 into law, expanding the STEM definition to include computer science.
- Officially including it in the definition signals the importance of a computer science education.



STEM Majors

Engineering majors

- General engineering
- Aerospace engineering
- Biological engineering
- Architectural engineering
- Biomedical engineering
- Chemical engineering
- Civil engineering
- Computer engineering
- Electrical engineering
- Engineering mechanics physics and science
- Environmental engineering
- Geological and geophysical engineering
- Industrial and manufacturing engineering
- Materials engineering and materials science
- Mechanical engineering
- Metallurgical engineering
- Mining and mineral engineering
- Naval architecture and marine engineering
- Nuclear engineering
- Petroleum engineering
- Miscellaneous engineering
- Engineering technologies
- Engineering and industrial management
- Electrical engineering technology
- Industrial production technologies
- Mechanical engineering related technologies
- Miscellaneous engineering technologies
- Military technologies

STEM Majors

- Animal sciences
- Food science
- Plant science and agronomy
- Soil science
- Environmental science
- Biology
- Biochemical sciences
- Botany
- Molecular biology
- Ecology

Physical and life sciences majors

- Genetics
- Microbiology
- Pharmacology
- Physiology
- Zoology
- Miscellaneous biology
- Nutrition sciences
- Neuroscience
- Cognitive science and biopsychology
- Physical sciences
- Astronomy and astrophysics
- Atmospheric sciences and meteorology
- Chemistry
- Geology and earth science
- Geosciences
- Oceanography
- Physics
- Nuclear, industrial radiology, and biological technologies

STEM Majors

- Computer and information systems
- Computer programming and data processing

Computer majors

- Computer science
- Information sciences

- Computer administration management and security
- Computer networking and telecommunications

Math majors

- Mathematics
- Applied mathematics

- Statistics and decision science

- Mathematics and computer science

2. Computer Science Career

- Demand is high
- Supply is low
- Plenty of opportunities



NACE

- National Association of Colleges and employers (NACE)
<https://www.naceweb.org/research/reports/>
- For the last three years (2016-18), **computer science** graduates have been the top earners among all disciplines.

Average Salaries Class of 2018 (BS)

BROAD CATEGORY	2019 SALARY PROJECTION	2018 SALARY PROJECTION	PERCENT CHANGE
Engineering	\$69,188	\$66,521	4.0%
Computer Science	\$67,539	\$66,005	2.3%
Math & Sciences	\$62,177	\$61,867	0.5%
Business	\$57,657	\$56,720	1.7%
Social Sciences	\$57,310	\$56,689	1.1%
Humanities	\$56,651	\$56,688	-0.1%

Source: Winter 2019 Salary Survey, National Association of Colleges and Employers

Average Salary by Discipline (MS)

BROAD CATEGORY	2019 SALARY PROJECTION	2018 SALARY PROJECTION	PERCENT CHANGE
Engineering	\$82,589	\$75,481	9.4%
Computer Science	\$81,466	\$75,103	8.5%
Business	\$77,347	\$69,756	10.9%
Math & Sciences	\$75,737	\$76,745	-1.3%

Source: Winter 2019 Salary Survey, National Association of Colleges and Employers

Salary Differential BS & MS Degrees

MAJOR	AVERAGE STARTING SALARY BY DEGREE LEVEL		DIFFERENTIAL
	BS	MS	
Business administration	\$57,133	\$84,580	\$27,447
Computer science	\$68,103	\$82,275	\$14,172

Source: Winter 2019 Salary Survey, National Association of Colleges and Employers

How about the future?

- High growth rate between 2012 and 2022 as predicted by BLS.

Engineering

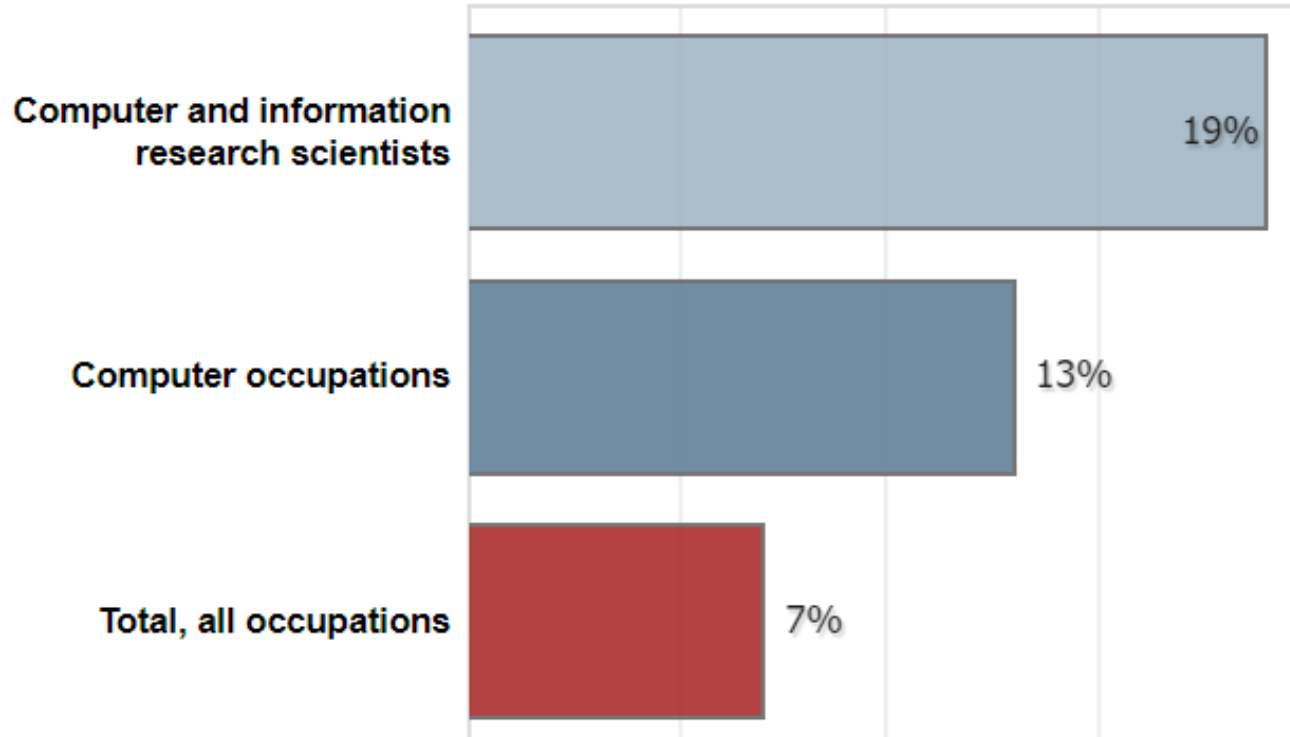
Occupational Title	Employment, 2012	Projected Employment, 2022	Change, 2012-22	
			Number	%
Engineers	1,571,900	1,750,300	178,300	11
Aerospace engineers	83,000	89,100	6,100	6
Biomedical engineers	19,400	24,600	5,200	27
Chemical engineers	33,300	34,800	1,500	4
Civil engineers	272,900	326,600	53,700	20
Computer hardware engineers	83,300	89,400	6,200	7
Electrical and electronics engineers	306,100	318,700	12,600	4
Environmental engineers	53,200	61,400	8,100	15
Industrial engineers	223,300	233,400	10,100	5
Mechanical engineers	258,100	269,700	11,600	5
Petroleum engineers	38,500	48,400	9,800	26

Occupational Title	Employment, 2012	Employment, 2022	Change, 2012-22	
			Number	%
Computer and information scientists, research	26,700	30,800	4,100	15
Computer and Information Systems Managers	332,700	383,600	50,900	15
Computer Hardware Engineer	83,300	89,400	6,200	7
Computer Programmers	343,700	372,100	28,400	8
Computer Support Specialists	722,400	447,800	155,800	53
All other computer specialists	209,300	845,300	123,000	17
Computer System Analysts	520,600	648,400	127,700	25
Database Administrator	118,700	136,600	17,900	15
Information Security Analysts	75,100	102,500	27,400	37
Network and Computer Systems Administrators	366,400	409,400	42,900	12
Software Developers	1,018,000	1,240,600	222,600	22

Job Outlook

Computer and Information Research Scientists

Percent change in employment, projected 2016-26



Note: All Occupations includes all occupations in the U.S. Economy.

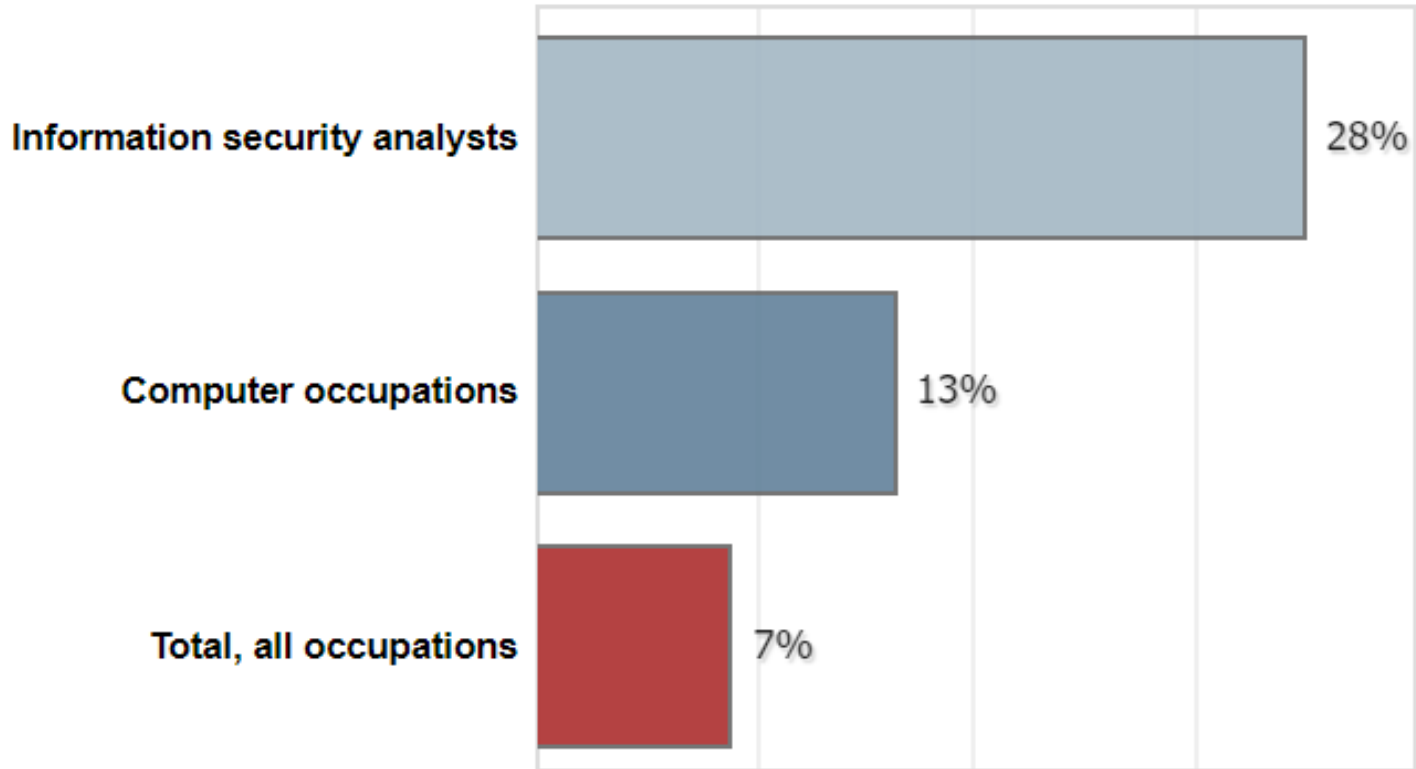
Source: U.S. Bureau of Labor Statistics, Employment Projections program

<https://www.bls.gov/ooh/computer-and-information-technology/computer-and-information-research-scientists.htm>

Job Outlooks

Information Security Analysts

Percent change in employment, projected 2016-26



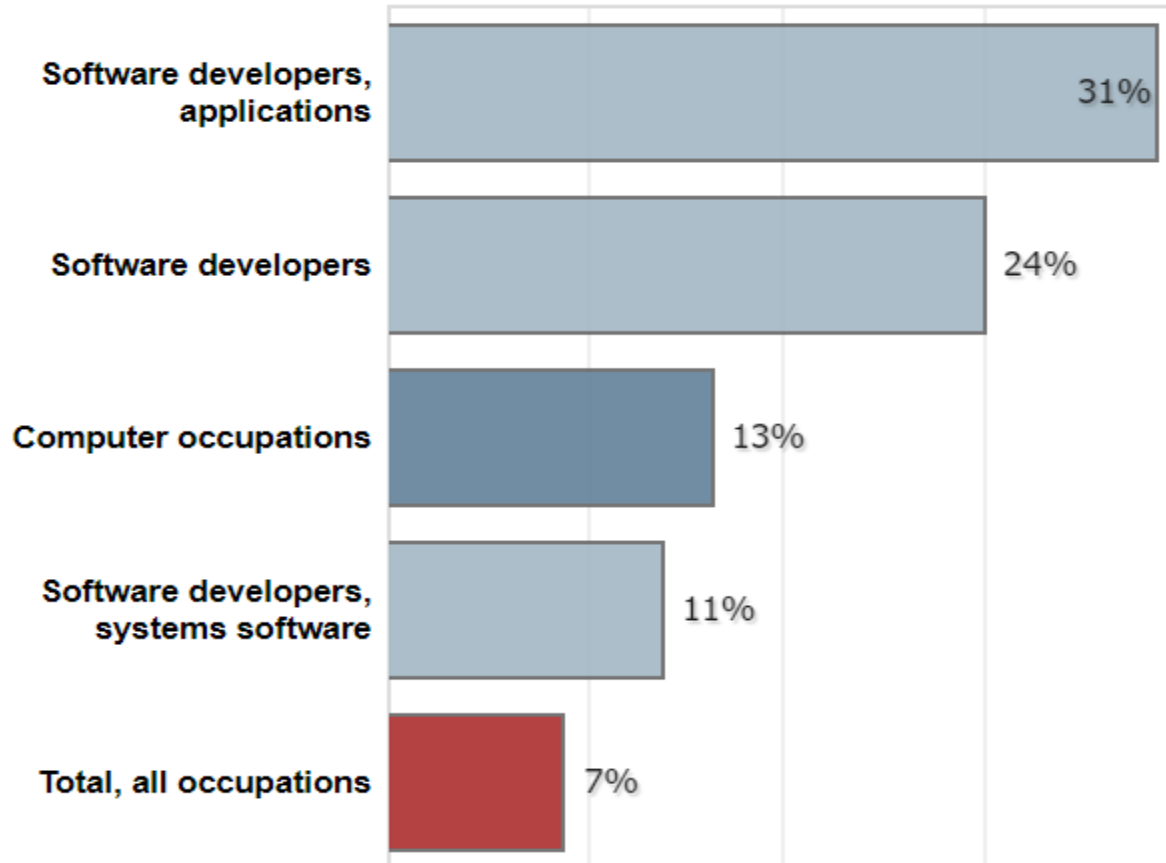
Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Employment Projections program

Job Outlooks

Software Developers

Percent change in employment, projected 2016-26



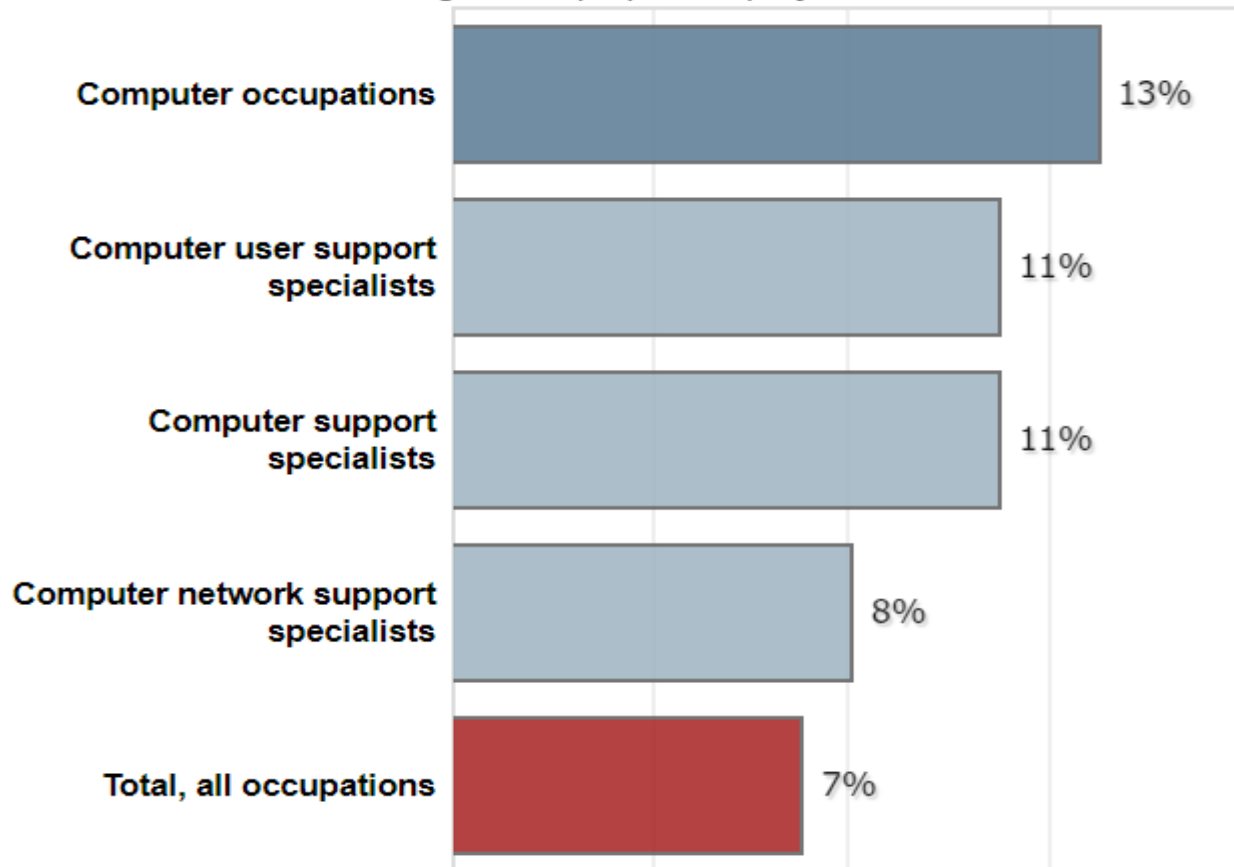
Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Employment Projections program

Job Outlooks

Computer Support Specialists

Percent change in employment, projected 2016-26



Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Employment Projections program

Quiz

- Of all the degrees of all universities in the US, which one is the most valuable one?
- Name the top ten university-major pairs.

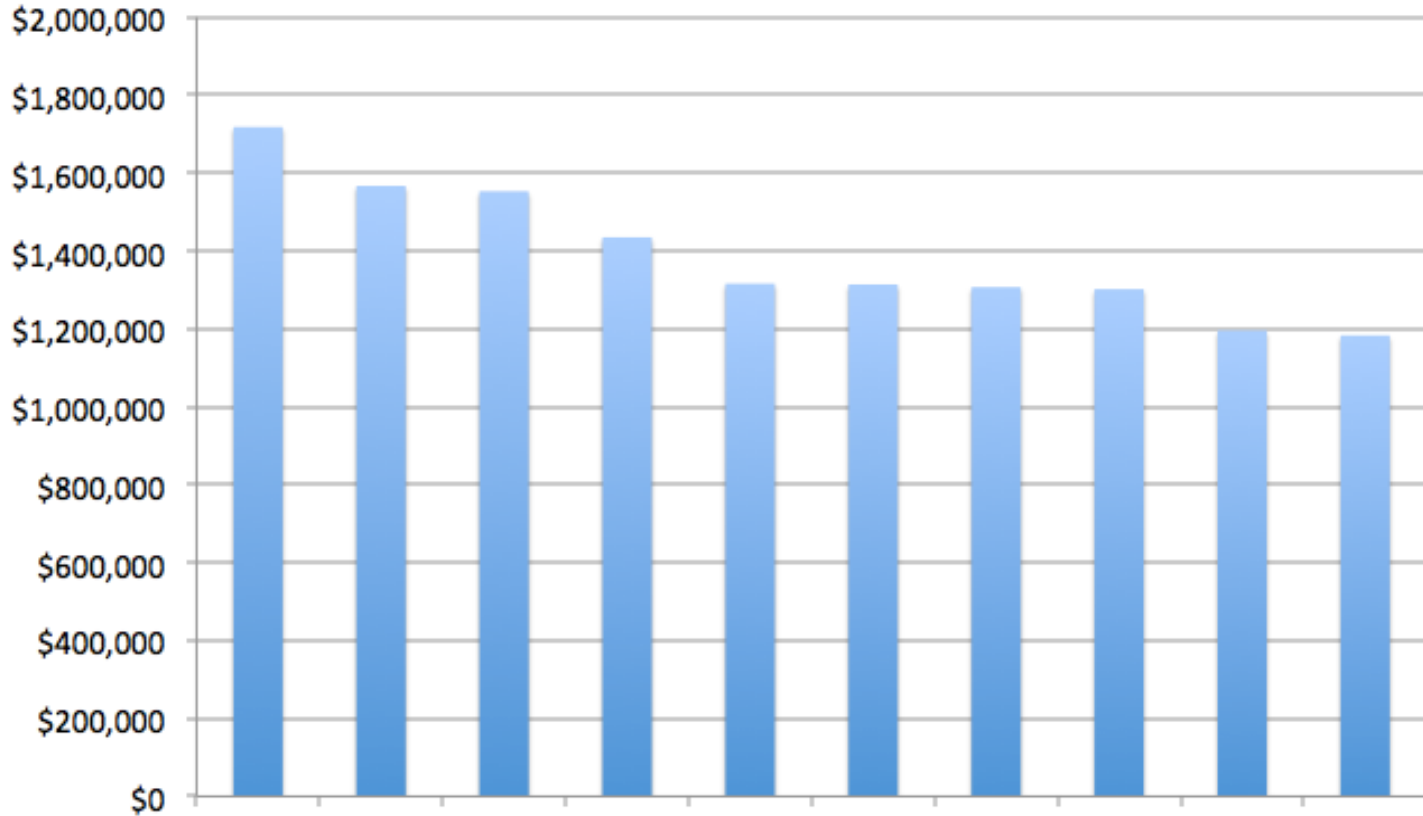
~600

~100

University	Major
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The Most Valuable Degrees in America

The 10 Programs With the Highest 20-Year Return



For all **degrees** of all **universities** in the U.S., select the most valuable degrees with the highest 20-Year return. Here are the top 10

Quiz

- What if my university is not Stanford or MIT (very low admission rate)?
- Will I earn a lot less if I go to a college with higher admission rate?
- Is there a difference between STEM and non-STEM fields?

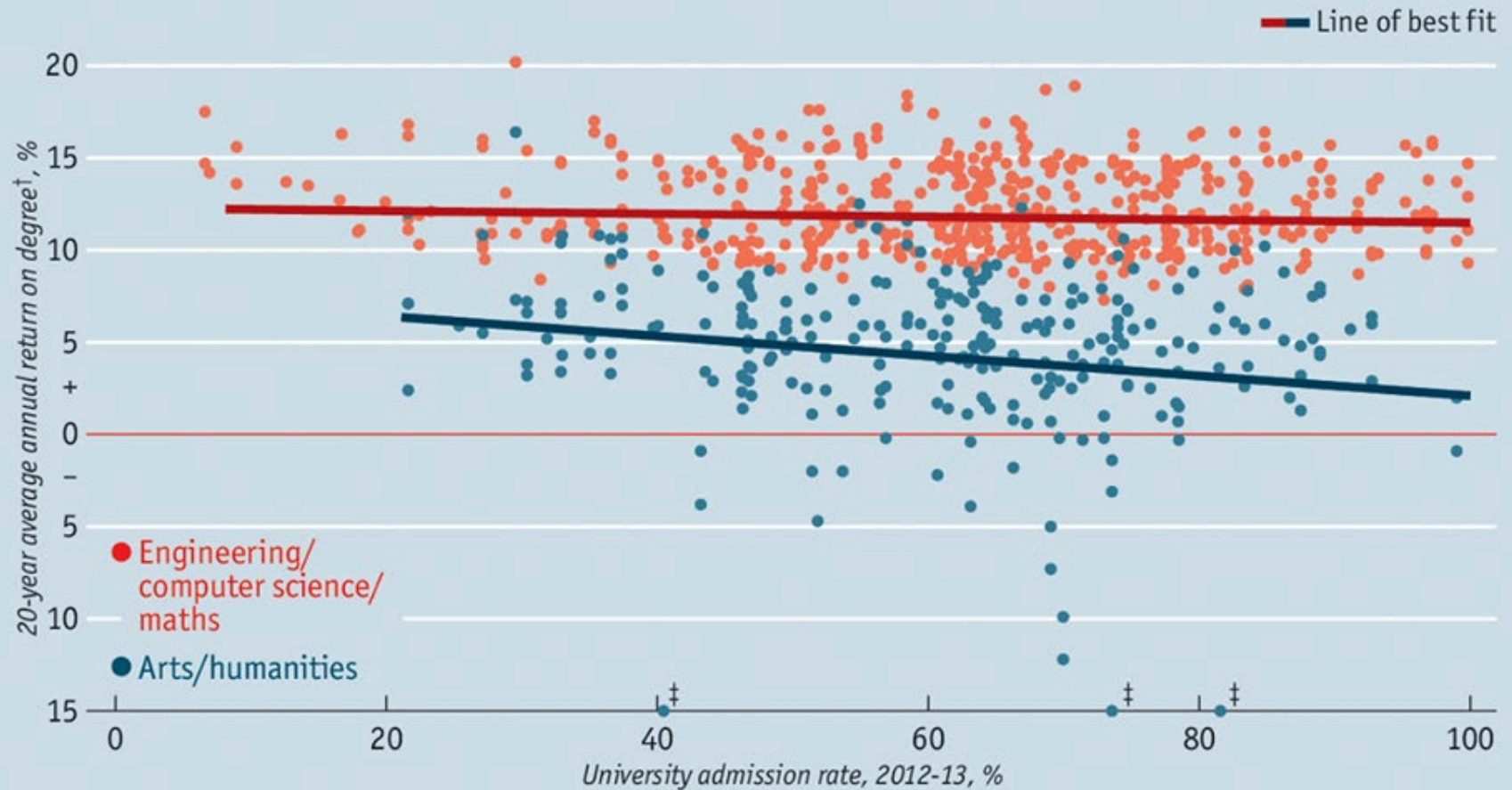
Economic Value

- Economists have found that graduates of selective universities **do not** out-earn those who were accepted by the same colleges but chose a “lesser” institution.
- On the other hand, what you studied matters.

What Matters is...

It's what you learn, not where

American universities*, selectivity and returns



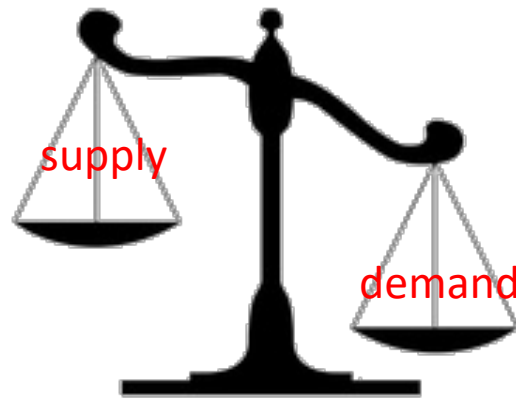
Sources: PayScale; National Centre for Education Statistics

*Sample of 240 institutions †Based on 2012-13

‡Returns of minus 15% or worse

Economist.com

Shortage in STEM/Computer Science Workforce



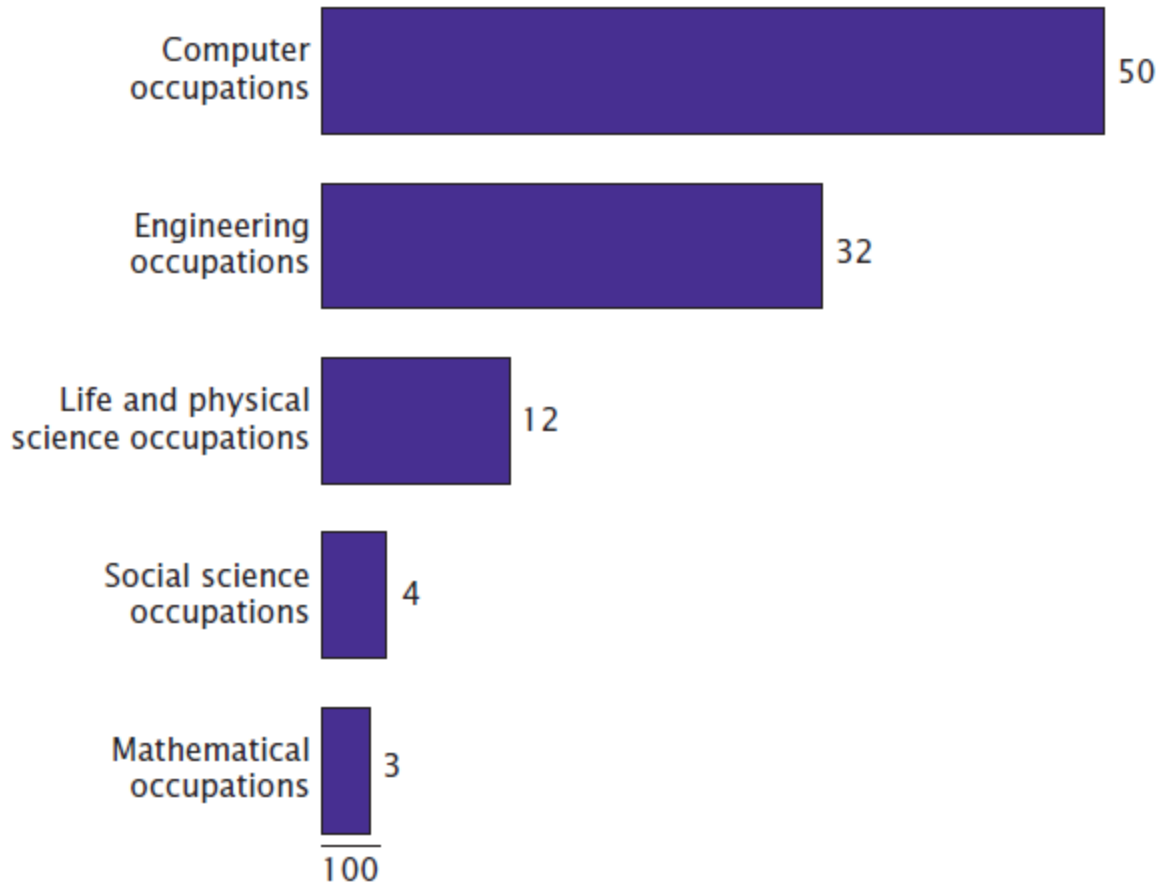
UH STEM Enrollment 2014-18

	2014	2015	2016	2017	2018
Engineering	4492	5071	4969	4554	4187
NSM	5074	5205	5523	5790	6018
Tech	4883	5737	6356	6520	6494
Computer Science	792	870	1054	2332	1365

Figure 3.

Occupational Distribution of STEM Workers

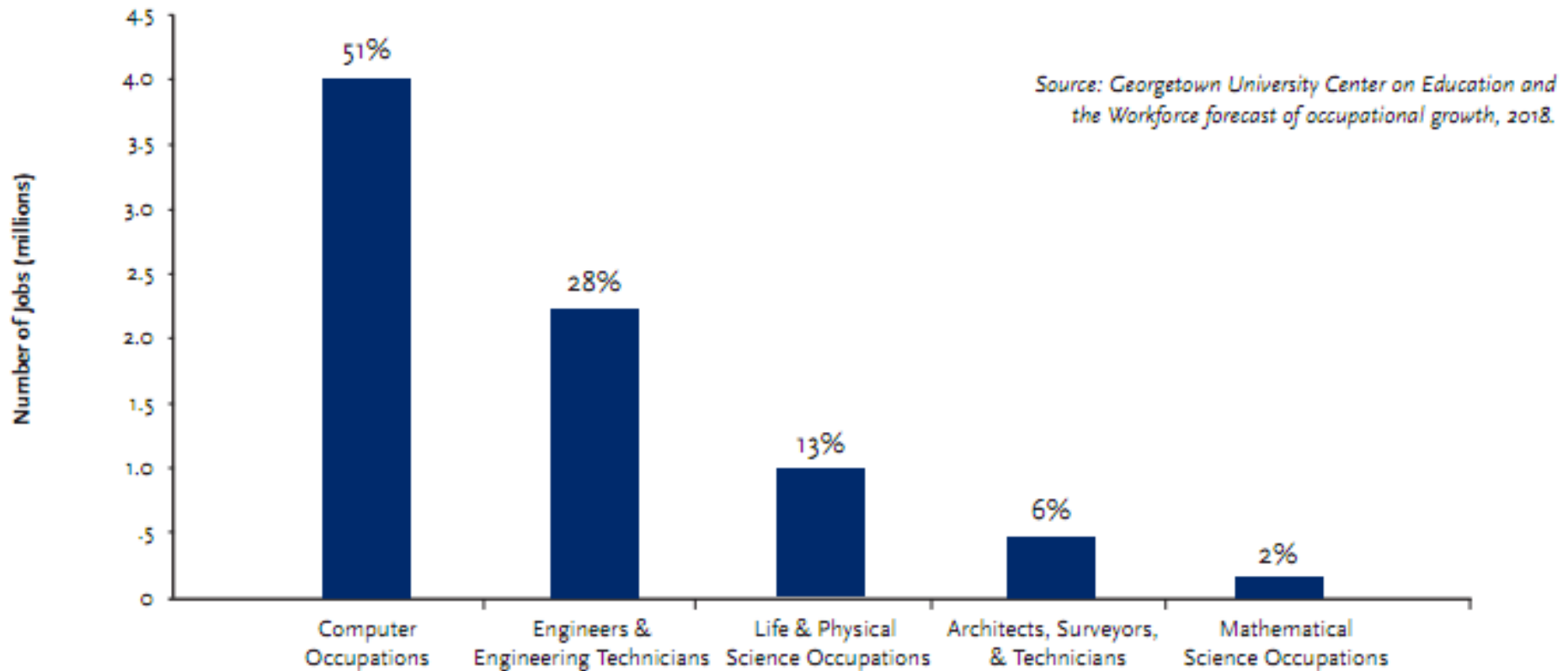
(In percent. Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)



Source: U.S. Census Bureau, 2011 American Community Survey.

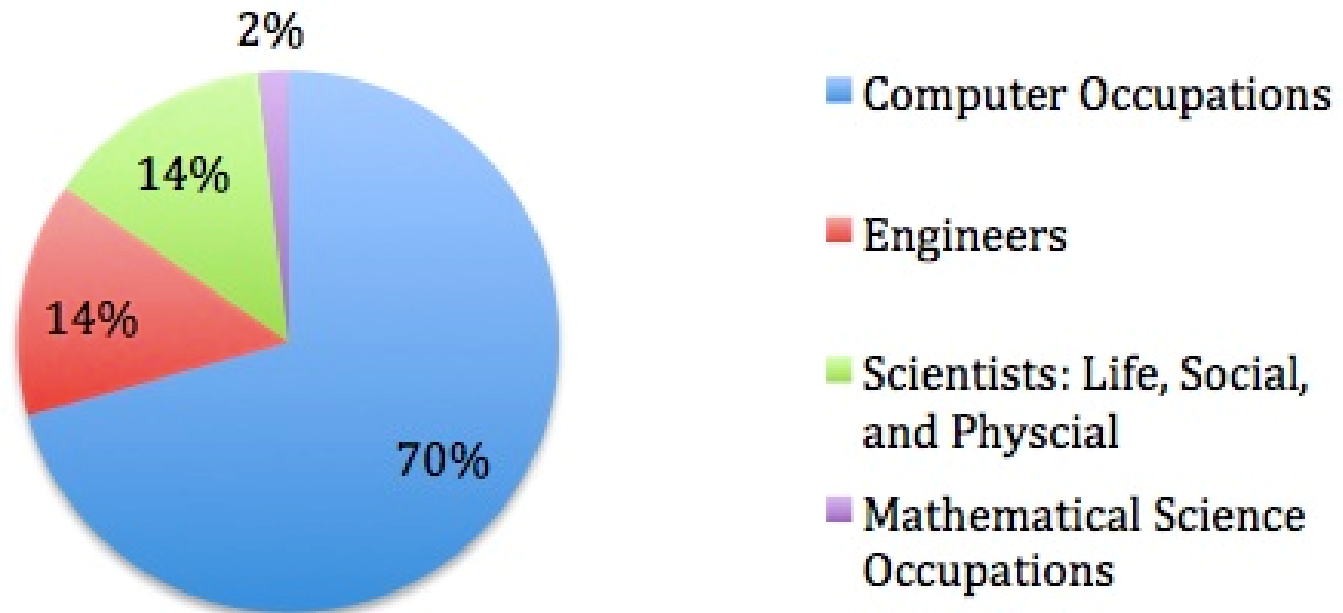
STEM Jobs in 2018

Figure 1: Computer occupations dominate STEM: 2018



Job Growth

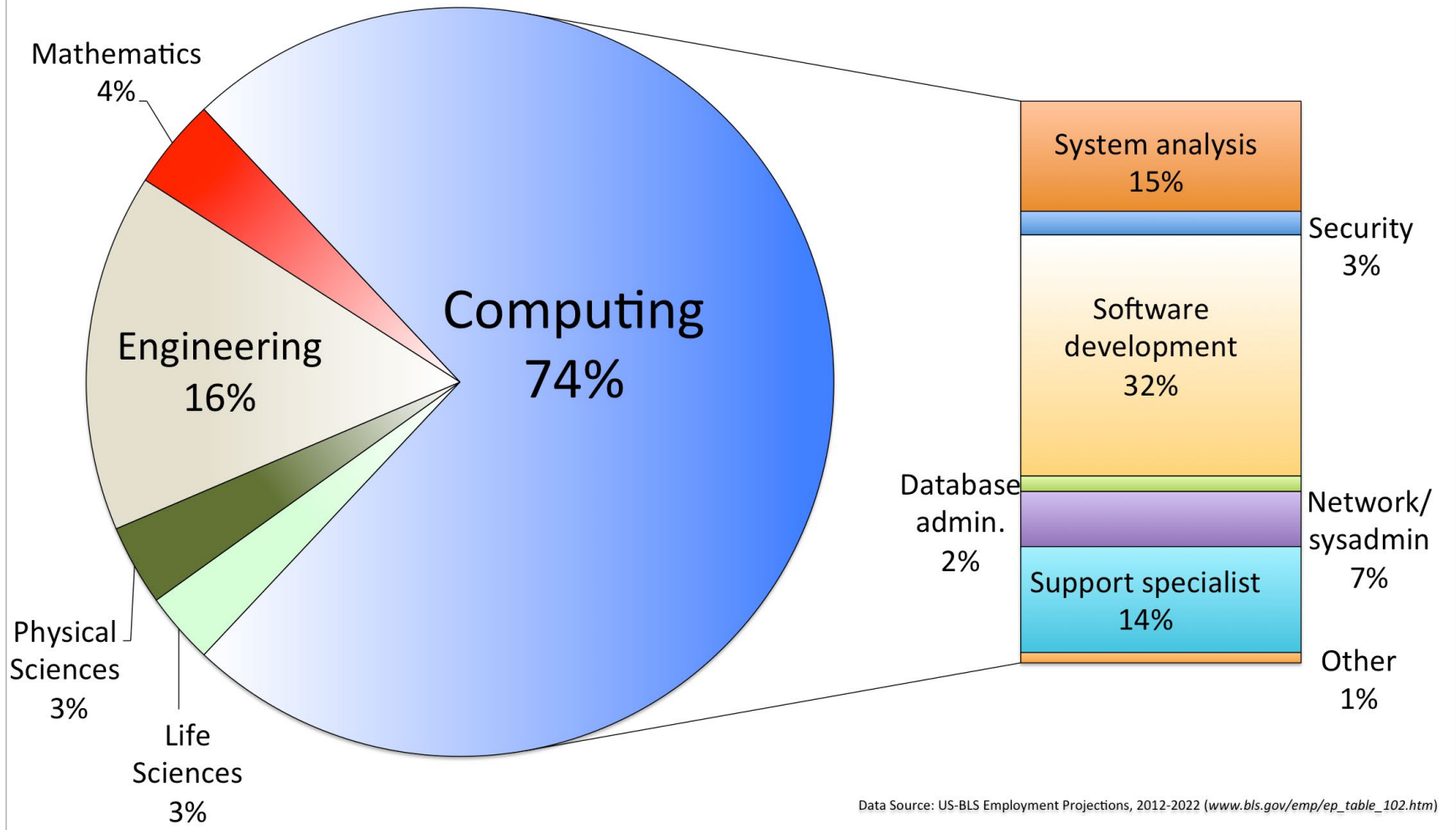
**Projected STEM Job Growth 2010 to 2020
(US Bureau of Labor Statistics)**



Nearly 3 out of 4 new science or engineering jobs in the U.S. are going to be in computing!

New STEM Jobs

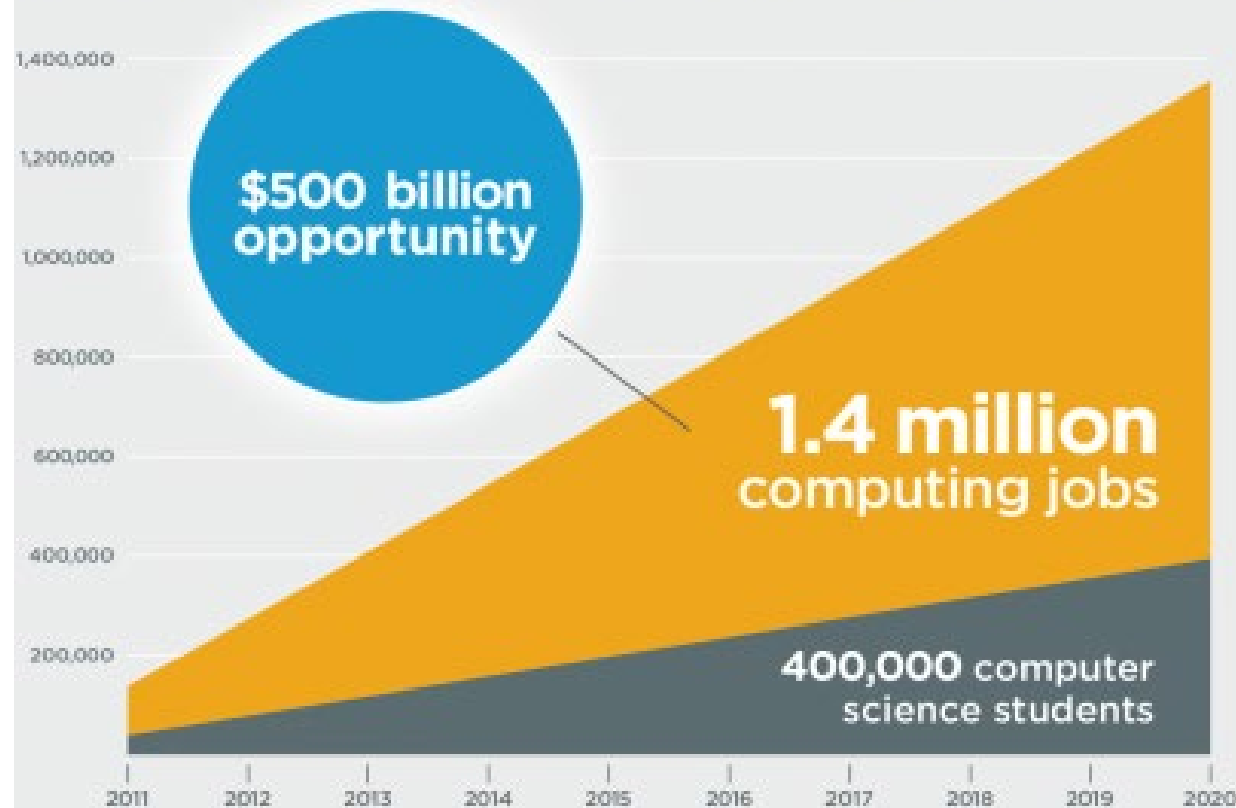
US-BLS New U.S. STEM Jobs Through 2022 by STEM %



Data Source: US-BLS Employment Projections, 2012-2022 (www.bls.gov/emp/ep_table_102.htm)

Gap

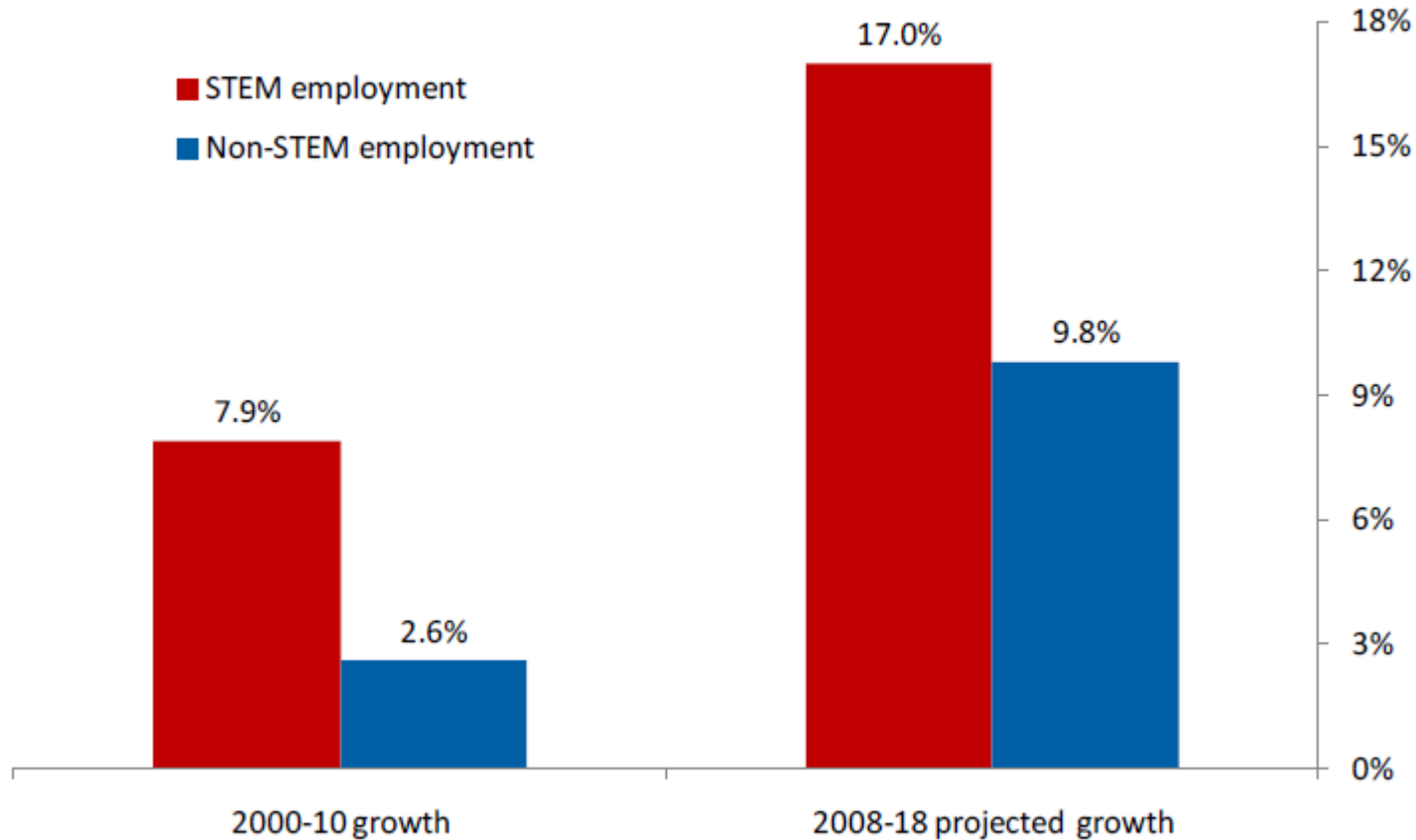
1,000,000 more jobs than students by 2020



Computer science is a top paying college degree and computer programming jobs are growing at 2X the national average.

STEM vs. Non-STEM

Figure 1. Recent and Projected Growth in STEM and Non-STEM Employment

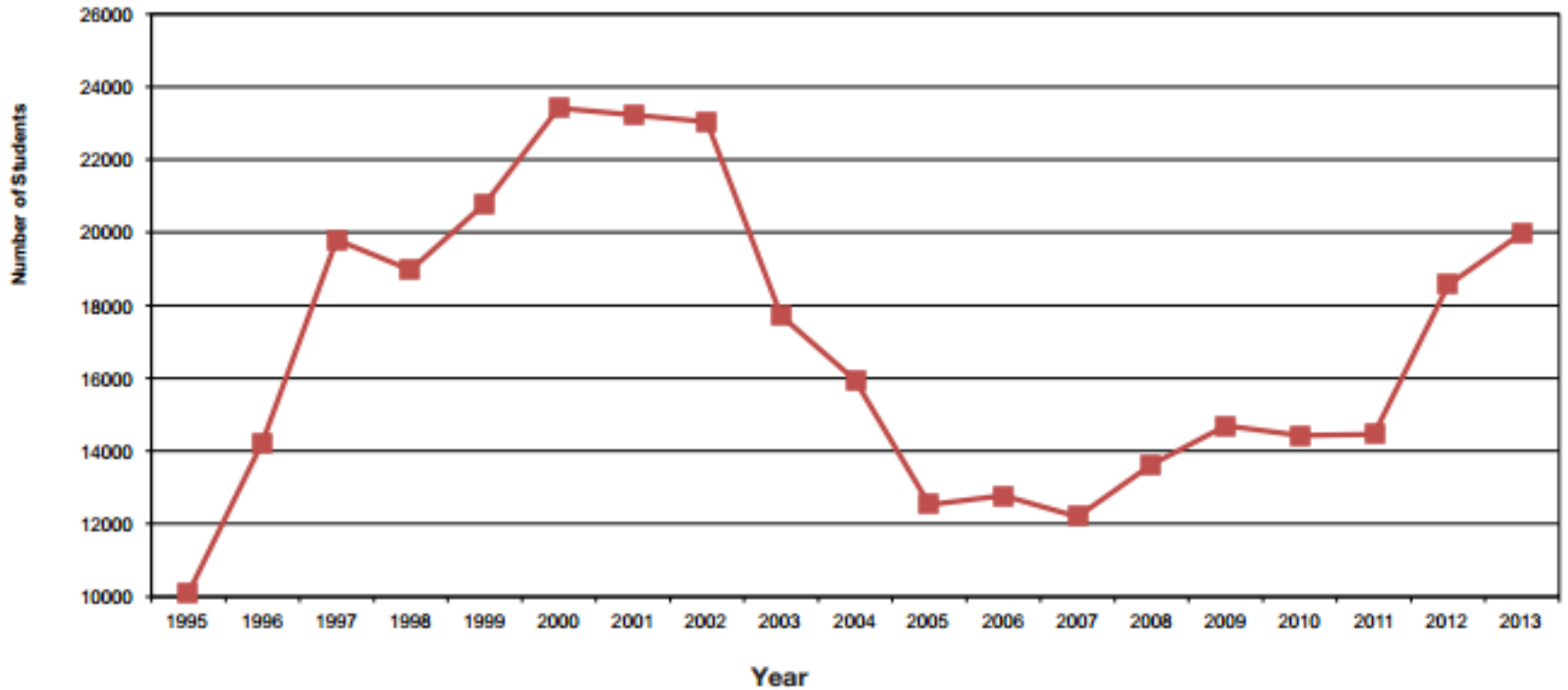


Source: ESA calculations using Current Population Survey public-use microdata and estimates from the Employment Projections Program of the Bureau of Labor Statistics.

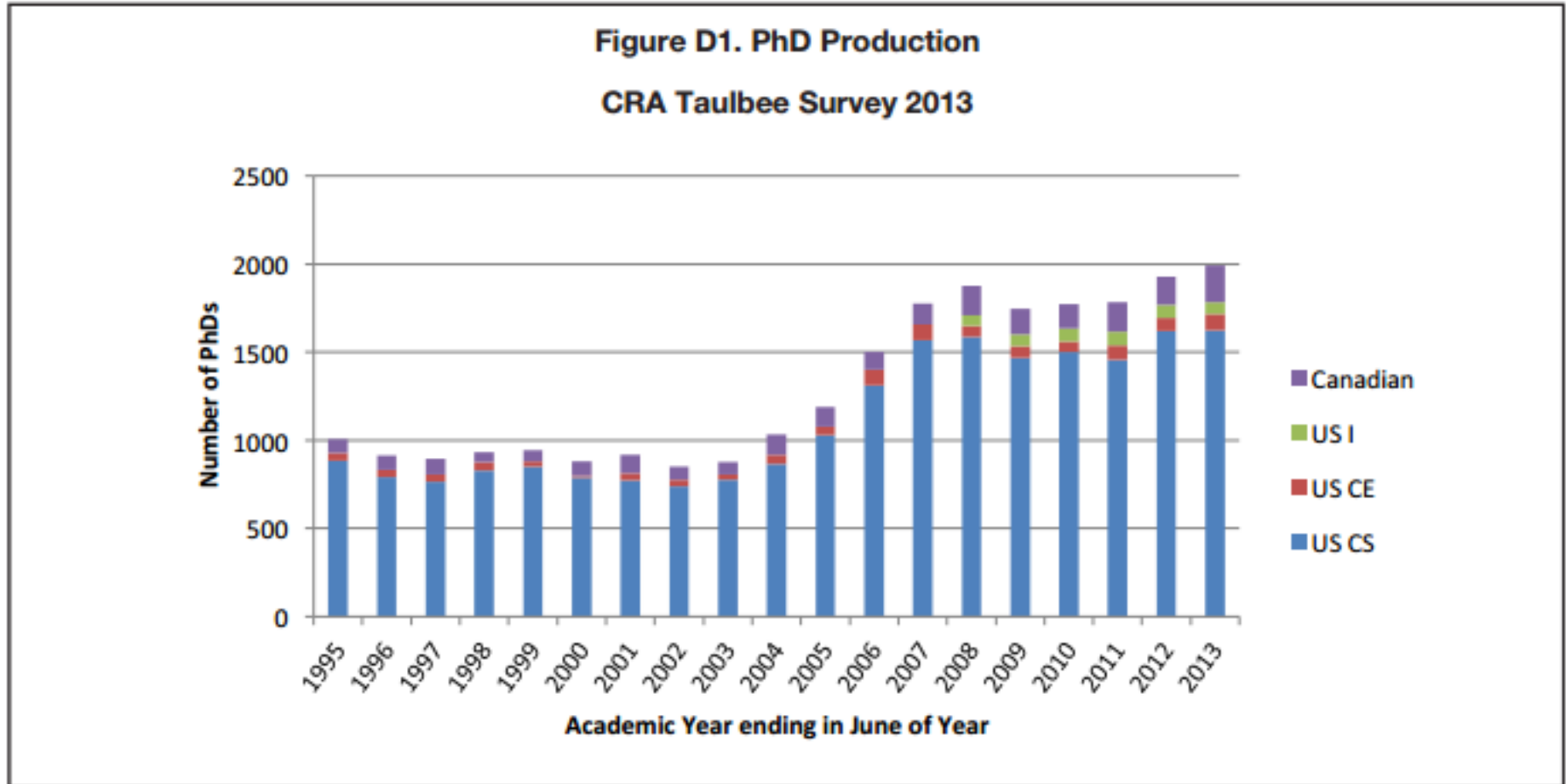
The Supply

New CS Students

Figure B2. Newly Declared CS/CE Undergraduate Majors



Taulbee 2013 Data



New PhD by Ethnicity

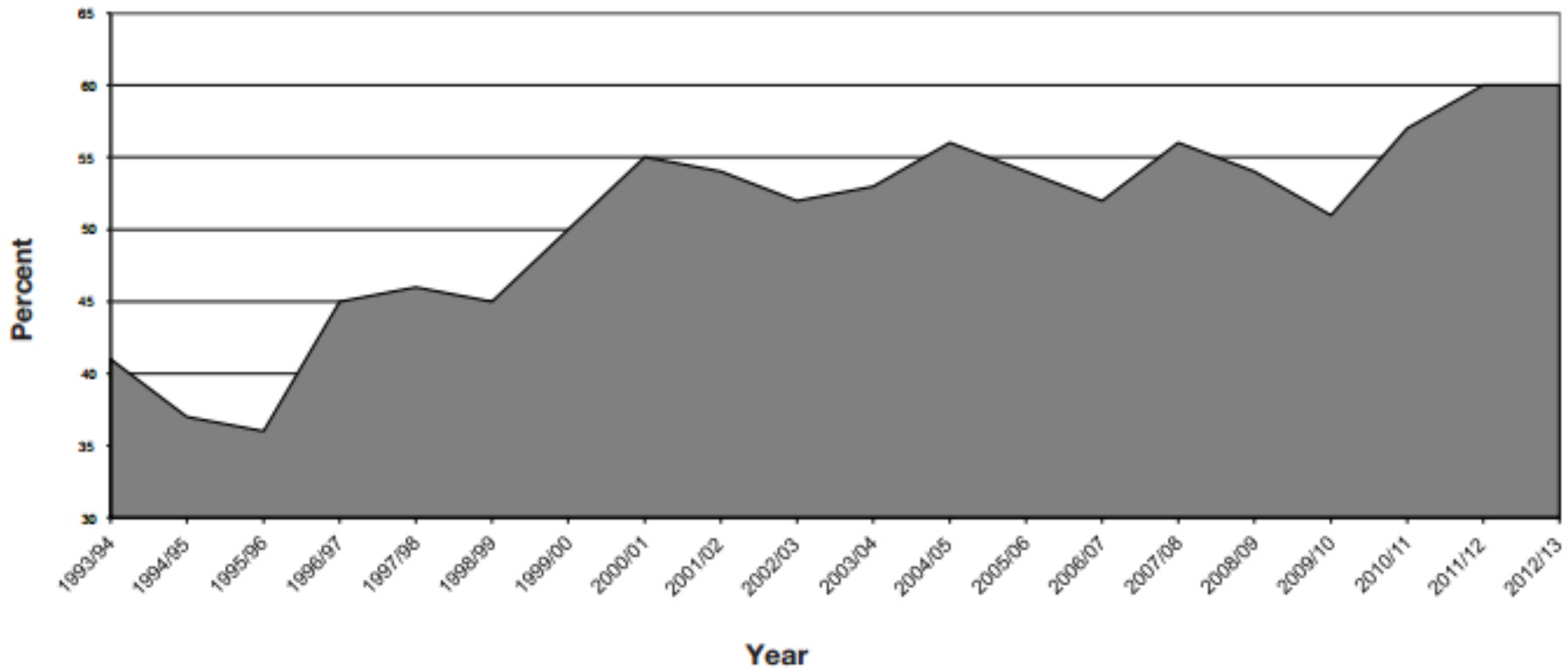
Table D3. PhDs Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	840	58.7%	132	66.0%	43	39.4%	1,015	58.3%
Amer Indian or Alaska Native	3	0.2%	0	0.0%	0	0.0%	3	0.2%
Asian	136	9.5%	14	7.0%	15	13.8%	165	9.5%
Black or African-American	22	1.5%	0	0.0%	2	1.8%	24	1.4%
Native Hawaiian/Pac Islander	3	0.2%	0	0.0%	0	0.0%	3	0.2%
White	406	28.4%	52	26.0%	47	43.1%	505	29.0%
Multiracial, not Hispanic	2	0.1%	0	0.0%	0	0.0%	2	0.1%
Hispanic, any race	20	1.4%	2	1.0%	2	1.8%	24	1.4%
Total Residency & Ethnicity Known	1,432		200		109		1,741	
Resident, ethnicity unknown	106		16		2		124	
Residency unknown	115		2		9		126	
Grand Total	1,653		218		120		1,991	

Taulbee 2014

Figure D2. Nonresident Aliens as Fraction of PhD Enrollments

CRA Taulbee Survey 2013



CS Degree Awarded by Ethnicity

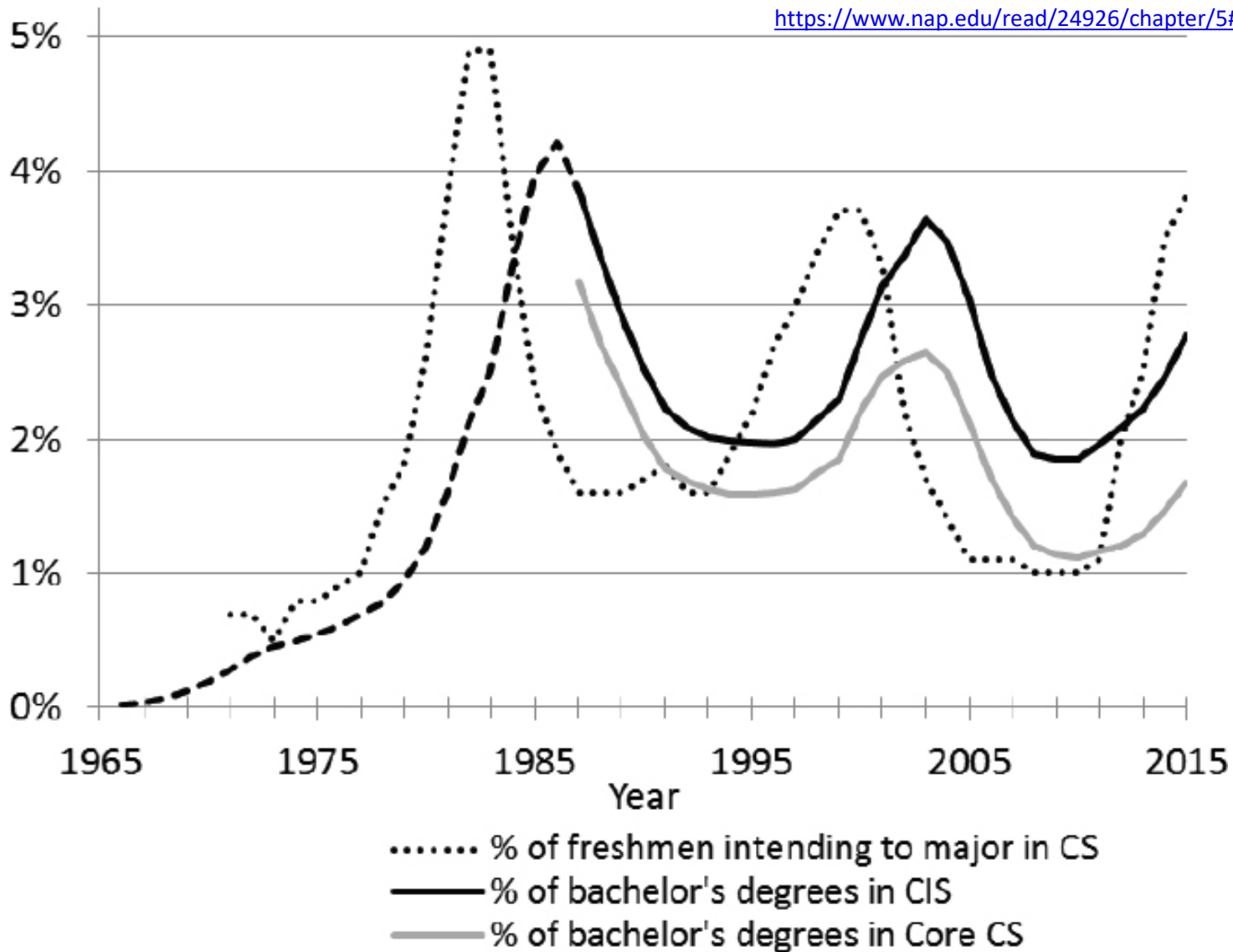
	BS		MS		PhD	
Nonresident Alien	698	8.3%	4,245	65.0%	6,679	60.7%
Amer Indian or Alaska Native	22	0.3%	9	0.1%	15	0.1%
Asian	1,545	18.4%	556	8.5%	648	5.9%
Black or African-American	322	3.8%	65	1.0%	145	1.3%
Native Hawaiian/Pac Islander	22	0.3%	4	0.1%	11	0.1%
White	5,131	61.2%	1,521	23.3%	3,268	29.7%
Multiracial, not Hispanic	141	1.7%	54	0.8%	48	0.4%
Hispanic, any race	499	6.0%	78	1.2%	184	1.7%
Total Residency & Ethnicity Known	8,380		6,532		10,998	
Resident, ethnicity unknown	498		246		514	
Residency unknown	1898		427		735	
Grand Total	10,776		7,205		12,247	

Are we doing enough?

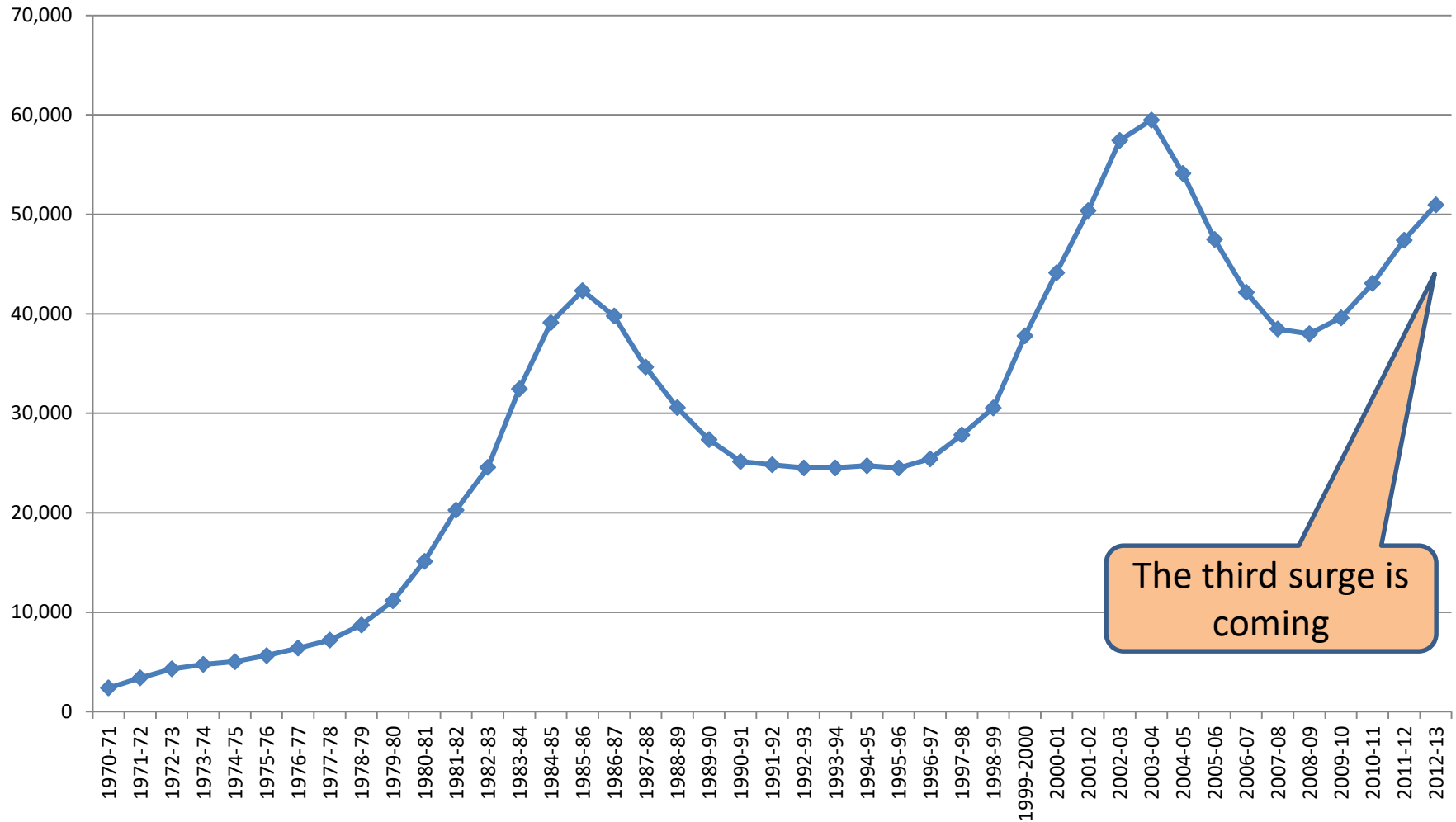
- 2014 CRA Taulbee reports (2013 data)
 - Survey includes US and Canadian PhD Granting universities
 - Majors:
 - CS: Computer Science
 - CE: Computer Engineering
 - I: Informatics

CS enrollments

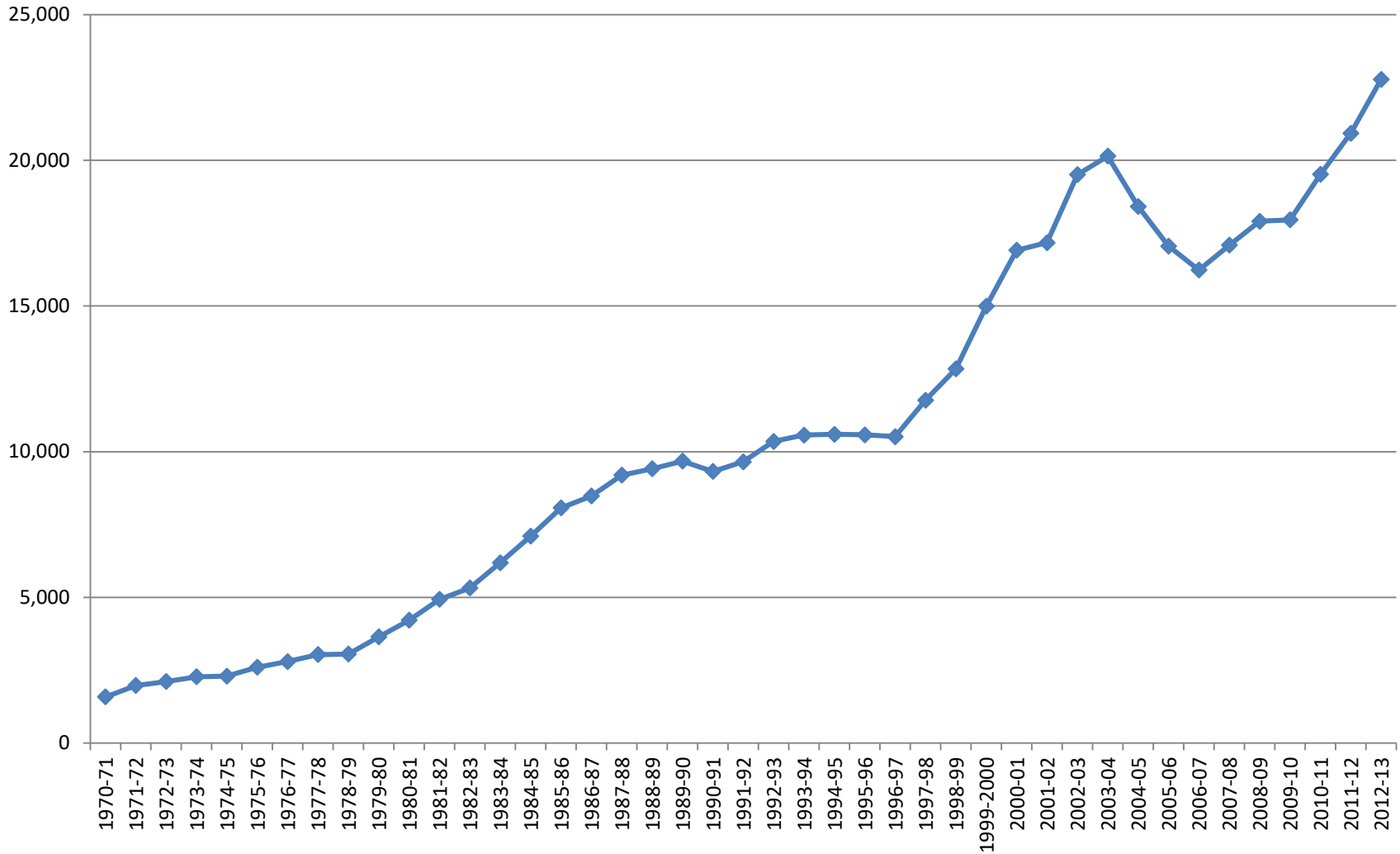
<https://www.nap.edu/read/24926/chapter/5#42>



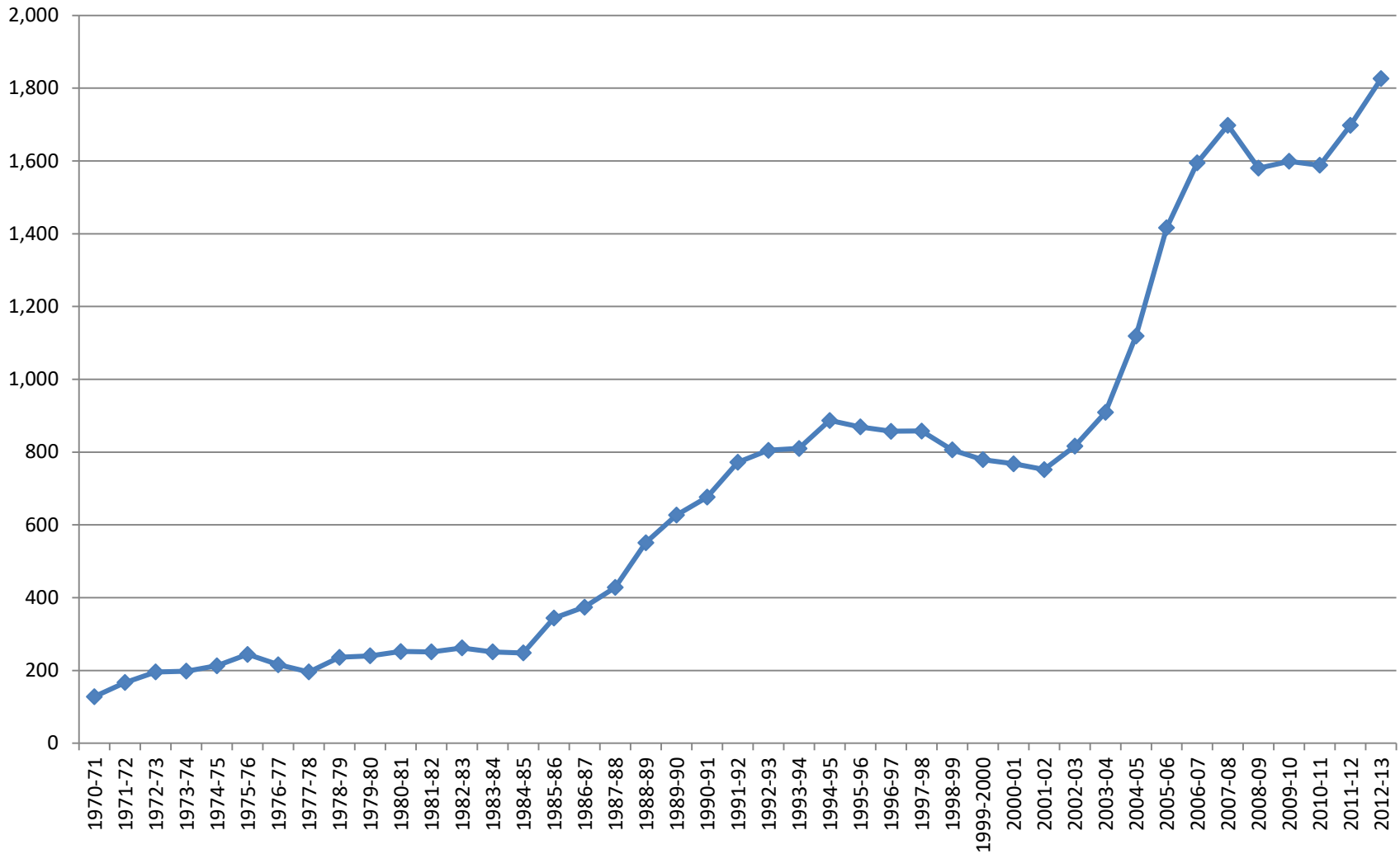
BS in CS Awarded



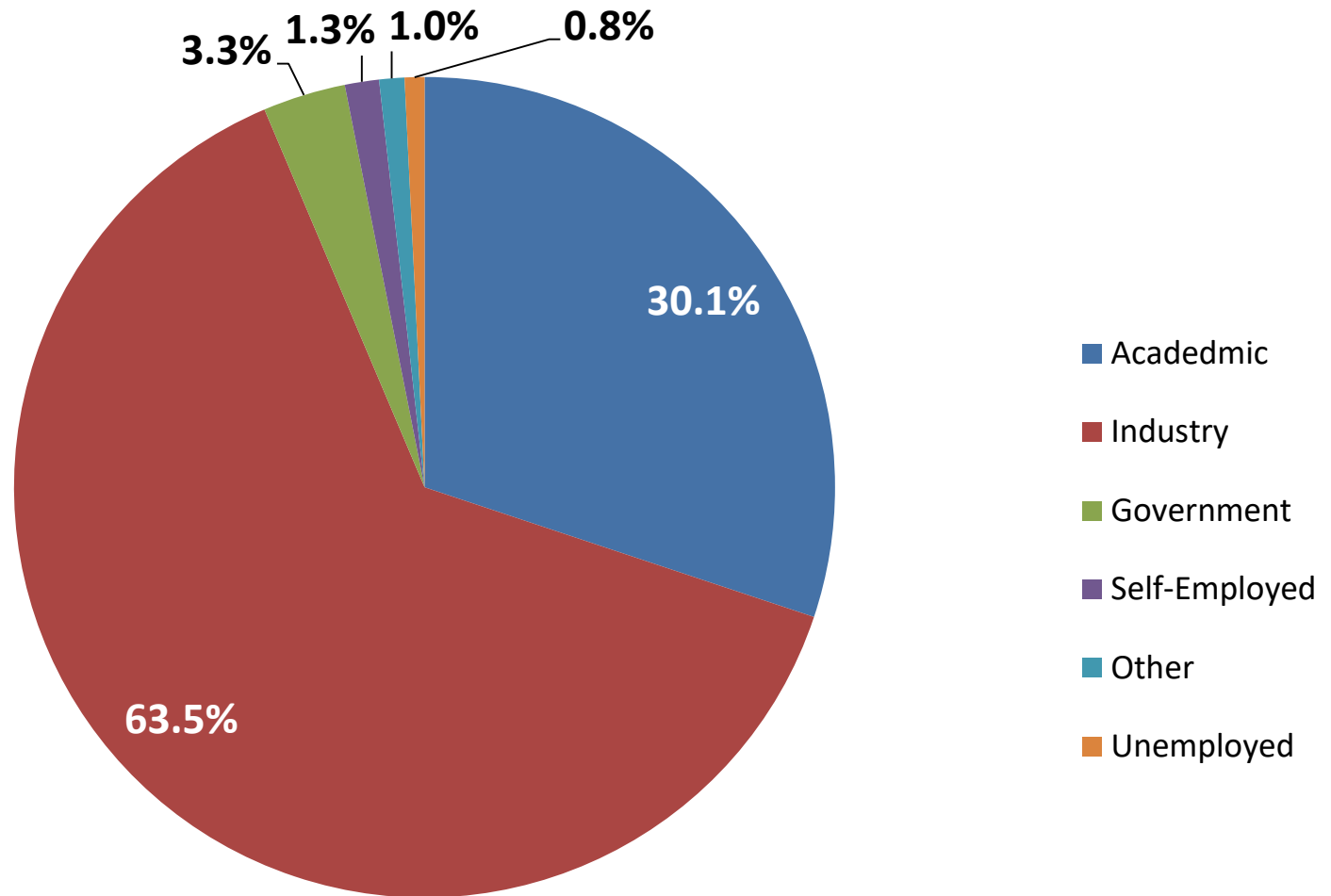
MS in CS Awarded



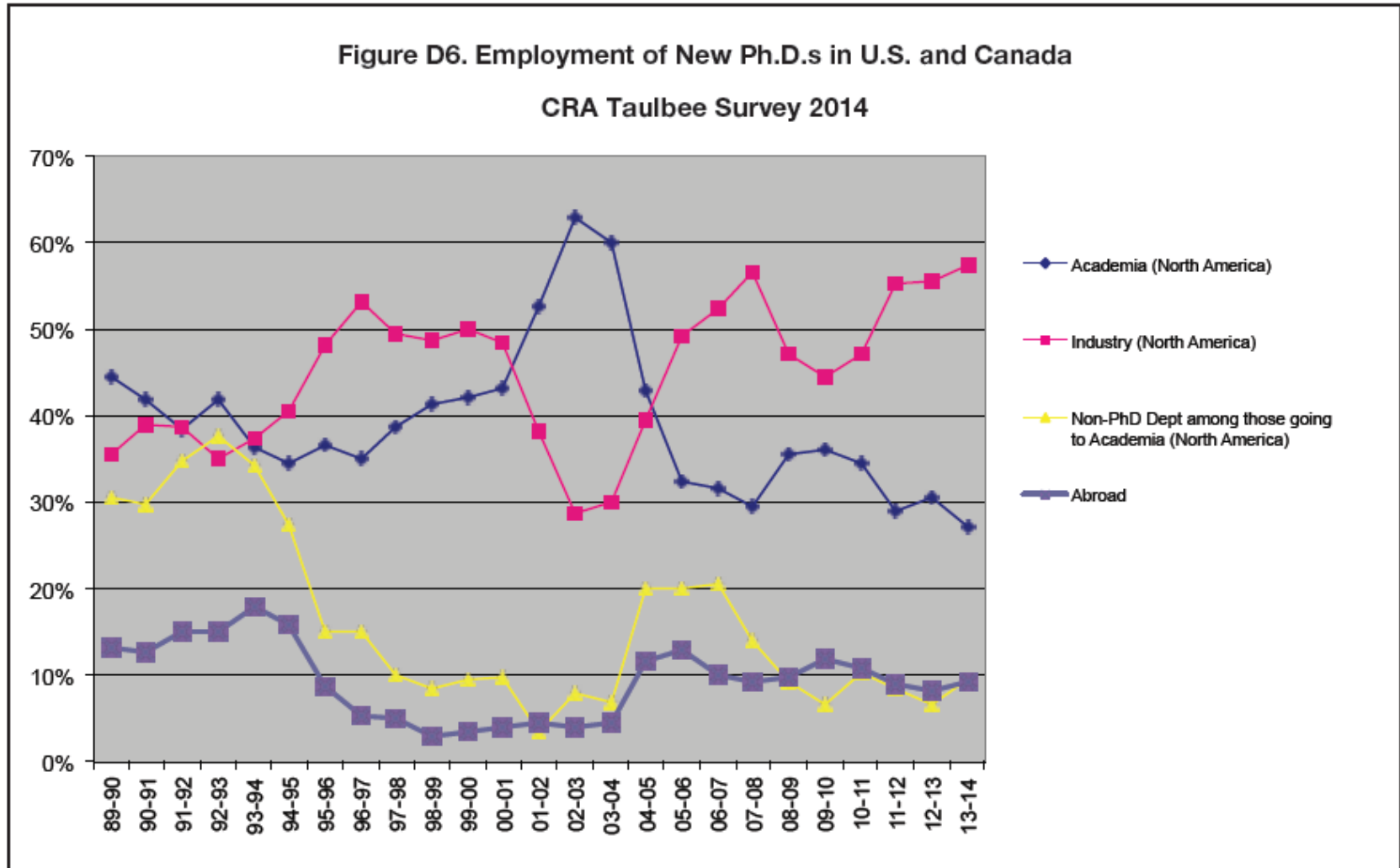
PhD in CS Degrees awarded



Employment of CS PhDs



What is the problem?



3. Graduate Study



Why Graduate School?

- The reasons vary from individual to individual and are based on many factors including, but not limited to,
 - career goals,
 - lifestyles,
 - family commitments,
 - personality, and
 - financial and other constraints.

Academic Minions



Bachelor



Master



PhD



Postdoc



PI



Emeritus Prof

Advantages

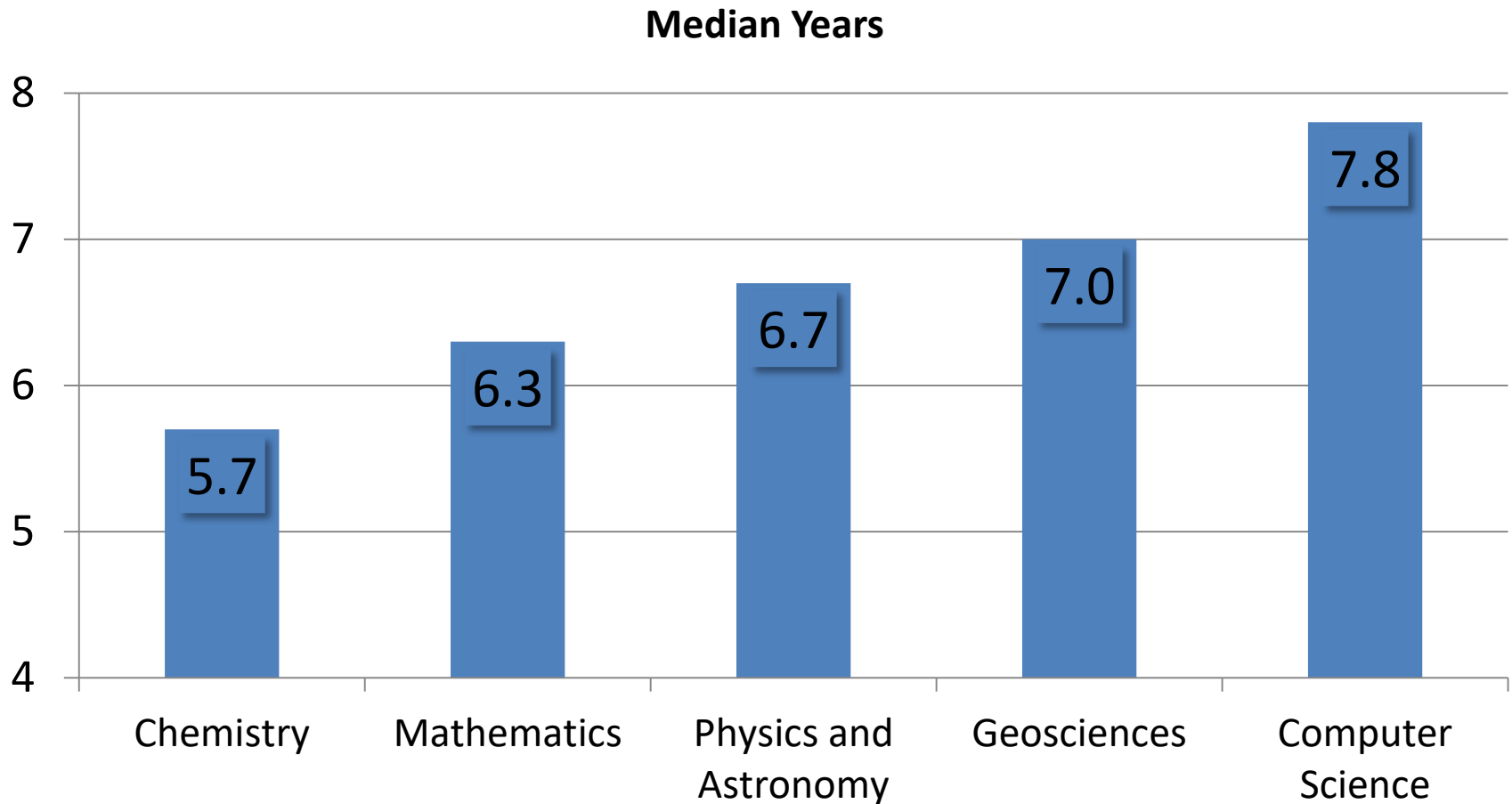
- Money should not be the only reason for going to graduate school, but
 - Advanced degree results in higher salary
 - Several years of missed opportunity of earning
 - MS: 1-3 years
 - PhD: 5-8 years
- Graduate students are often adequately supported (tuition and a stipend) to attend graduate school in Computer Science.

Payscale.com Salary Report

2015-16

	Early Career	Mid-career
CS-BS	62,900	107,600
CS-MS	81,200	121,500
CS-DR	112,000	129,000

Time to Doctorate of Physical Sciences



<http://www.nsf.gov/statistics/sed/2013/data/tab58.pdf>

Other Advantages

- Challenging projects to pursue,
- Flexibility in choosing projects
- Responsibility and Satisfaction
- More credibility among peers
- Obtaining interesting jobs
- Improving your job performance
- Some jobs require an advanced degree

Faculty Salary

Table S1. **Nine-month Salaries, 138 Responses of 187 US CS Departments, Percentiles from Department Averages**

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	109	115	118	12	101	127	10	131	115	69	80
Indiv	549	516	538	89	326	830	52	635	544	350	483
10	\$118,476	\$118,090	\$110,110	\$139,090	\$92,244	\$94,364	\$96,357	\$84,048	\$53,811	\$59,265	\$41,622
25	\$133,728	\$127,925	\$123,301	\$151,849	\$97,797	\$100,363	\$102,366	\$88,549	\$59,496	\$68,809	\$45,865
50	\$153,572	\$143,086	\$134,246	\$159,221	\$103,497	\$107,447	\$108,800	\$94,191	\$70,993	\$87,395	\$52,980
75	\$169,388	\$164,518	\$148,648	\$182,173	\$114,606	\$115,333	\$141,825	\$100,614	\$81,500	\$99,035	\$59,515
90	\$195,935	\$184,056	\$164,934	\$201,620	\$122,738	\$124,095	\$161,593	\$106,015	\$97,500	\$121,546	\$68,282

Academic Life



Assistant
Professor



Associate
Professor



Full
Professor



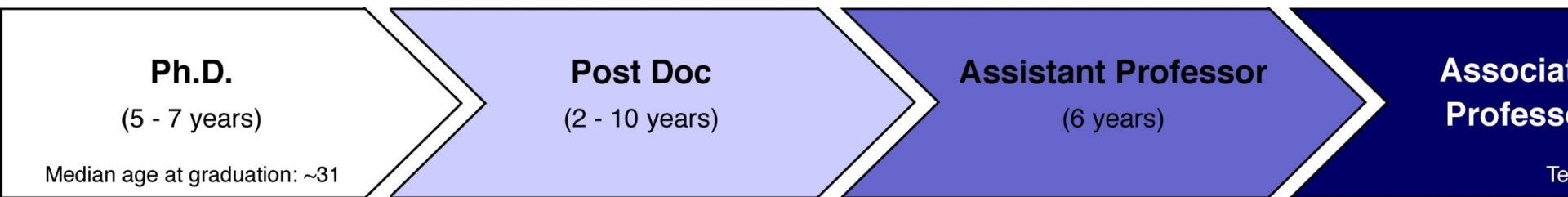
Professor
Emeritus



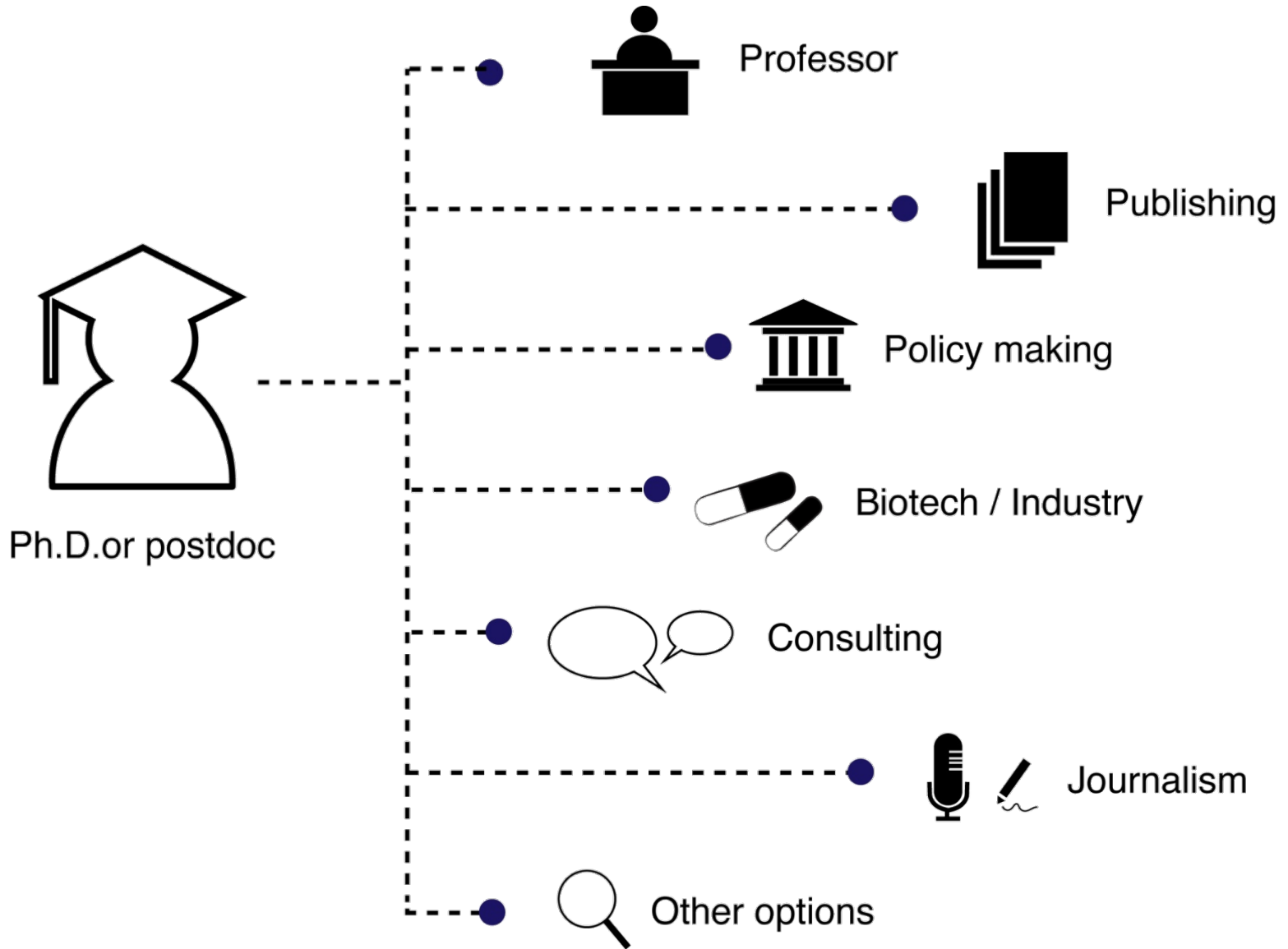
Adjunct
Professor

@AcademicBoy

Academic Route

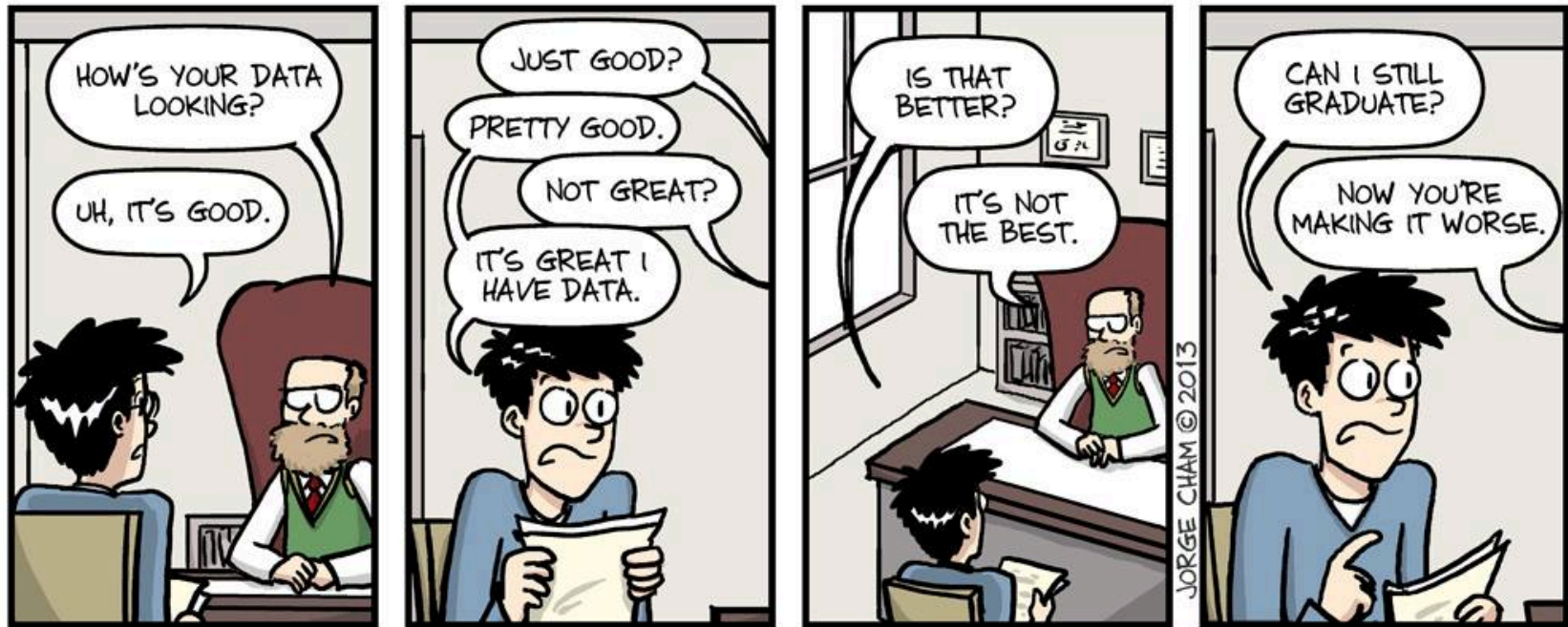


Opportunities



Not for Everyone

- Demanding, stressful, ...
- Assess your ability
- Do you enjoy doing research?



WWW.PHDCOMICS.COM

MS vs. Ph.D.

- MS Only. If you are certain that you are not interested in continuing for the Ph.D., then you should consider a “terminal” master’s program.
- MS, and then possibly a Ph.D.
- Ph.D., and possibly receiving MS along the way)
- Students applying for a master’s degree only often are not considered for financial aid.

Should I get an MS first?

TABLE 5. Median total time to degree, registered time to degree, and age at doctorate, by master's degree status and field of study: Academic year 2003

Field of study	No master's degree earned				Doctorate-related master's degree earned ^a				Non-doctorate-related masters degree earned ^a			
	<i>N</i>	TTD	RTD	Age	<i>N</i>	TTD	RTD	Age	<i>N</i>	TTD	RTD	Age
All fields	9,734	7.4	6.2	30.7	22,655	10.6	7.8	33.7	5,932	14.6	8.9	38.1
Life sciences	3,444	7.1	6.1	29.9	2,327	9.9	7.7	32.6	498	10.5	8.1	33.2
Agricultural sciences	104	8.5	5.5	32.4	668	10.3	7.2	33.4	88	14.2	9.0	36.3
Biological sciences	3,340	7.1	6.2	29.8	1,659	9.7	7.9	32.3	410	10.3	8.0	33.0
Physical sciences ^b	2,157	6.4	5.8	29.3	2,877	8.5	7.3	31.2	612	11.4	8.2	33.8
Chemistry	1,150	6.0	5.6	28.8	681	8.5	7.3	30.8	102	9.5	7.8	32.4
Computer science	144	8.1	6.9	31.7	473	9.2	7.7	32.1	186	12.9	8.5	35.4
Earth, atmospheric, and ocean sciences	188	7.1	6.0	30.0	399	10.1	7.7	33.0	151	12.4	8.6	35.5
Mathematics	252	6.4	5.9	29.4	613	8.0	7.0	30.6	82	11.4	8.2	33.5
Physics and astronomy	414	6.9	6.4	29.5	711	7.9	7.1	30.5	71	9.9	8.0	32.2

Selecting a program

- Determine the area of your interests before determine the schools
- Each department may have its strength and weakness
- Possibility of changing interests
- The “right” balance between depth in one area and overall breadth is something you should try to determine.
- If you are not sure (which is okay), pick a department with some breadth.

Specialty

Table D4. Employment of New PhD Recipients By Specialty

	Artificial Intelligence	Computer-Supported Cooperative Work	Databases / Information Retrieval	Graphics/Visualization	Hardware/Architecture	Human-Computer Interaction	High-Performance Computing	Informatics: Biomedical/Other Science	Information Assurance/Security	Information Science	Information Systems	Networks	Operating Systems	Programming Languages/Compilers	Robotics/Vision	Scientific/ Numerical Computing	Social Computing/ Social Informatics	Software Engineering	Theory and Algorithms	Other	Total	
North American PhD Granting Depts.																						
Tenure-track	6	0	14	6	7	8	1	6	8	11	5	13	2	4	2	0	4	10	4	10	121	7.7%
Researcher	4	1	3	4	1	3	1	2	1	0	1	5	1	0	2	2	1	5	2	7	46	2.9%
Postdoc	33	2	14	16	4	8	6	23	9	2	0	15	3	7	18	3	1	9	27	35	235	14.9%
Teaching Faculty	5	0	3	1	1	2	0	0	3	2	0	6	1	3	1	2	0	8	3	7	48	3.0%
North American, Other Academic																						
Other CS/CE/I Dept.	3	2	0	4	0	4	1	1	2	2	1	2	0	1	0	2	0	5	1	2	33	2.1%
Non-CS/CE/I Dept																						
North American, Non-Academic																						
Industry	74	6	62	42	53	31	37	21	27	14	17	77	42	34	34	15	12	83	44	151	876	55.5%
Government	7	0	2	3	2	3	7	4	5	1	0	1	0	1	2	2	0	1	0	5	46	2.9%
Self-Employed	5	0	3	2	0	1	0	0	1	1	0	1	1	0	0	0	1	1	0	4	21	1.3%
Unemployed	1	0	2	0	0	1	0	0	0	1	0	2	1	0	0	1	0	1	0	2	12	0.8%
Other	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0	0	0	0	0	4	9	0.6%
Total Inside North America																						
	138	11	103	78	68	61	53	57	56	37	24	123	51	51	59	27	19	123	81	227	1,447	91.8%

Other things to think about

- What are the considerations?
- Deciding where to accept
- Graduate School Application Process

Research Expenditure

Table R1. Total Expenditure from External Sources for Computing Research

Department Type	# Depts	Percentile of Department Averages				
		10th	25th	50th	75th	90th
US CS Public	87	\$593,406	\$1,840,219	\$3,743,805	\$7,796,783	\$15,252,450
US CS Private	31	\$906,575	\$2,445,560	\$4,872,000	\$11,000,000	\$23,695,307
US CE	5			\$3,099,835		
US Information	9			\$4,416,679		
Canadian	11	\$194,548	\$1,110,236	\$3,595,968	\$6,000,000	\$6,374,580

Evaluating Graduate Programs

- Classification of Universities
- University/Department Ranking
- (Federal) Research Funding

Carnegie Foundation Ranking

- UH is ranked as a top tier Research University in the 2010 report.



Carnegie Foundation

- Basic Classification (Total 4,664)
 - Doctorate-Granting Universities (335, 7%)
 - Master's Colleges and Universities (741, 16%)
 - Baccalaureate Colleges (583, 13%)
 - Baccalaureate/Associate Colleges* (408, 9%)
 - Associate's Colleges (1,113, 24%)
 - Special Focus Institutions 2Y (444, 10%)
 - Special Focus Institutions 4Y (1,005, 22%)
 - Tribal Colleges (35, 1%)

Doctorate-Granting Universities

- **Doctoral University: Highest Research Activity, 108 (115 for 2015)**
- **Doctoral University: Higher Research Activity, 99 (105)**
- **Doctoral University: Moderate Research Activity, 90 (109)**

Research Expenditures

- In a 2013 report produced by National Science Foundation (NSF), the Computer Science **research expenditures** at UH ranked 49th (out of 494) in the nation during 2011.
- UH's R&D expenditure in Computer Science was about \$8.7 million.
- Our ranking on **federally funded** research expenditures (\$5.8 million) is 46th in the nation.



CAE Designation

- UH has been designated the National Center of Academic Excellence in Cyber Defense Research (CAE-R) by the National Security Agency (NSA) and Department of Homeland Security (DHS).
- UH is among 60 universities that have earned such designations after passing a rigorous review of its Information Assurance Program.
- One of three Texas Universities with dual designation.



Academic Ranking of World Universities

- Academic Ranking of World Universities (ARWU) published by Shanghai Jiao Tong University ranks UH's **Computer Science** program 51st-75th in the world.
- In the 2014 ranking, if we count only the universities in the **U.S.**, the ranking is 29th to 40th.



世界大學
學術排名

Rankings

- US News & world Report
- World University Ranking
 - <https://www.timeshighereducation.com/world-university-rankings/by-subject>
- CS Rankings
 - <http://csrankings.org>
- Academic Ranking of World Universities (ARWU)
 - <http://www.shanghairanking.com/Shanghairanking-Subject-Rankings/computer-science-engineering.html>

Financial Support



Financial Support

- Typically graduate students are supported by
 - Teaching Assistantships
 - Research Assistantships
 - Fellowships
 - On-Campus employment
- FAFSA does not count parents' income in cost-of-attendance (COA).

Type of Support

Table G1. Graduate Students Supported as Full-Time Students by Department Type

Department Type	# Dept	On Institutional Funds						On External Funds						Total
		Teaching Assistants		Research Assistants		Full-Support Fellows		Teaching Assistants		Research Assistants		Full-Support Fellows		
US CS Public	105	2,470	34.3%	755	10.5%	275	3.8%	10	0.1%	3,398	47.2%	298	4.1%	7,206
US CS Private	36	597	20.2%	568	19.2%	186	6.3%	16	0.5%	1,400	47.3%	192	6.5%	2,959
US CS Total	141	3,067	30.2%	1,323	13.0%	461	4.5%	26	0.3%	4,798	47.2%	490	4.8%	10,165
US CE	9	58	16.6%	131	37.5%	22	6.3%	0	0.0%	134	38.4%	4	1.1%	349
US I	10	162	37.7%	41	9.5%	22	5.1%	1	0.2%	194	45.1%	10	2.3%	430
Canadian	15	294	31.3%	168	17.9%	93	9.9%	0	0.0%	351	37.3%	34	3.6%	940
Grand Total	175	3,581	30.1%	1,663	14.0%	598	5.0%	27	0.2%	5,477	46.1%	538	4.5%	11,884

Amount of Support

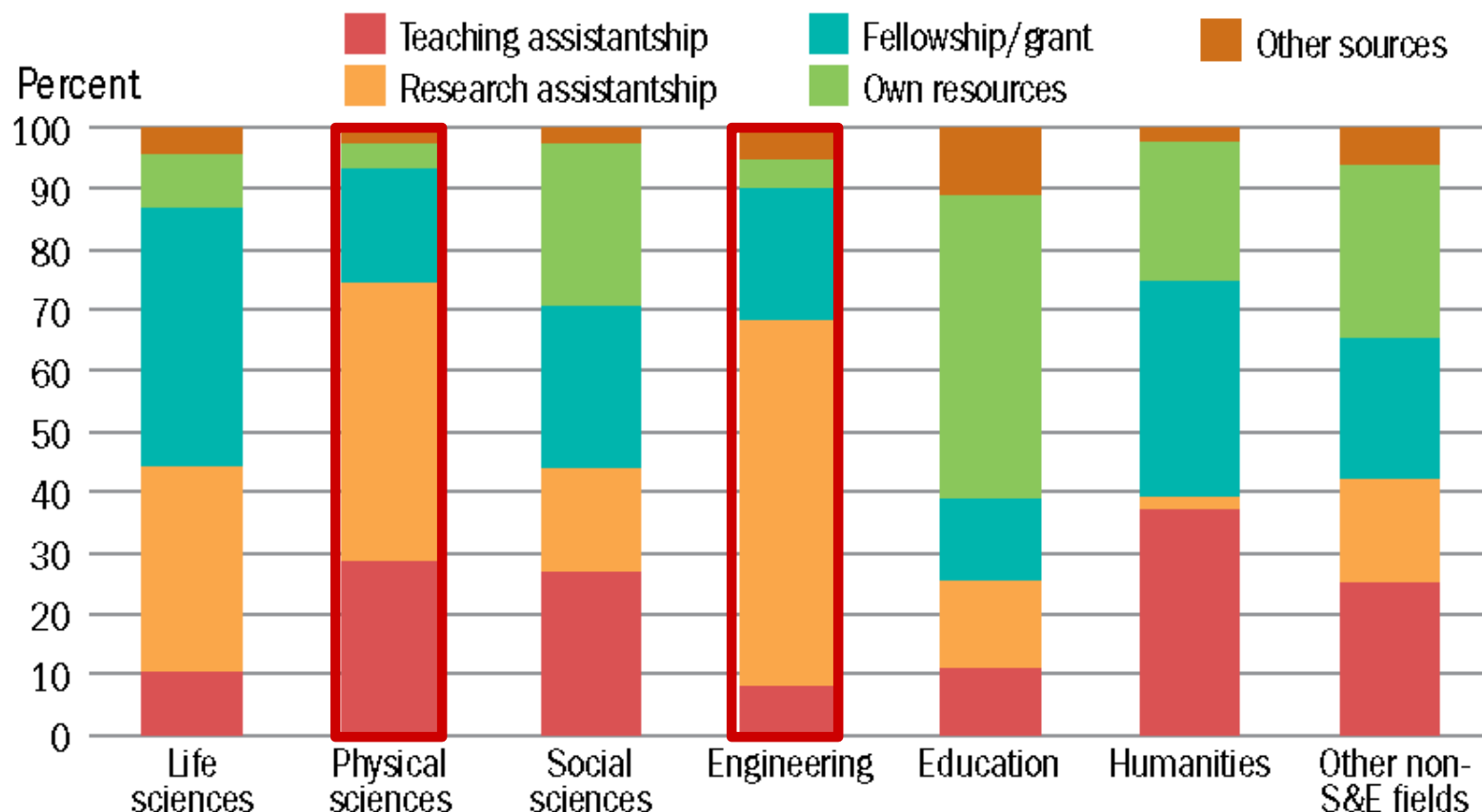
Table G2. Fall 2013 Academic-Year Graduate Stipends by Department Type and Support Type						
Teaching Assistantships						
		Percentiles of Department Averages				
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	97	\$12,000	\$13,801	\$16,500	\$17,948	\$20,710
US CS Private	28	\$2,263	\$11,520	\$20,210	\$22,784	\$25,560
US CE	7			\$18,000		
US Information	7			\$18,600		
Canadian	9			\$13,360		
Research Assistantships						
		Percentiles of Department Averages				
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	95	\$12,106	\$14,982	\$17,000	\$19,000	\$22,568
US CS Private	31	\$2,836	\$18,315	\$21,375	\$23,060	\$27,959
US CE	8			\$19,700		
US Information	7			\$18,600		
Canadian	8			\$19,500		
Full-Support Fellows						
		Percentiles of Department Averages				
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	56	\$15,476	\$18,000	\$20,770	\$24,725	\$30,000
US CS Private	24	\$10,920	\$21,145	\$23,988	\$28,464	\$30,000
US CE	3			\$24,650		
US Information	6			\$22,976		
Canadian	3			\$16,369		

Typical Support at UH

- Salary of \sim \$1,800 per month for 9 months.
- In-state tuition for non-resident (a saving of \$5,000 \sim \$8,000)
- DTF waives the in-state tuition (\sim \$3,000)
- Medical benefit (\$150/mo)

Source of Financial Support

Primary source of financial support, by field of study: 2011



Doctorate Recipients from U.S. Universities 2011. Related detailed data: tables 35, 36, 37.



NSF's Graduate Research Fellowships Program

Stephen Huang, University of Houston
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GRFP

- GRFP: Graduate Research Fellowship Program
- Purpose: to help ensure the vitality and diversity of the scientific and engineering workforce in the US.
- Support: outstanding graduate students who are pursuing research-based master's and doctoral degrees in fields within NSF's mission.

Support

- Amount of Support:
 - A stipend of **\$30,000**/year to the fellow.
 - A cost-of-education allowance of \$10,500/year to the university (will increase to \$12,000/year).
 - The institution is required to exempt Fellows from paying **tuition and fees** normally charged to students.
- Duration: 3 years (usable over 5 years)
- Availability: 2,000 new fellowships per year

CyberCorps: Scholarships for Service (SFS)

Department of Computer Science
University of Houston

Benefits

- Scholarship awardees will receive:
 - A generous stipend
 - \$30,000 per year for PhD
 - \$25,000 for MS
 - All tuition and fees paid
 - Up to \$9,300 for resident with summer
 - Up to \$20,400 for non-resident with summer
 - Allowance for books, health insurance, travel, and other professional development
 - Participation in SFS activities such as conferences, workshops, and seminars
 - Support for summer internships and permanent jobs placement

Qualifications

- U.S. Citizen (no Permanent Residents)
- A full-time graduate student
 - MS: within 2 years of graduation
 - PhD: within 3 years of graduation
- Must focus on the study of cybersecurity
- Willing and able to work for Federal, state, local or tribal government agencies

Service

- Recipients will work after graduation for a Federal, State, Local, or Tribal Government organization in a position related to cybersecurity for a period equal to the length of the scholarship.
- Internship and final job placements in government organizations typically require high-level security clearances and scholarship recipients are required to undergo the background investigation necessary to obtain such clearances as part of the job and/or internship application process.

Links

- CRA, <http://www.cra.org>
- ACM, <http://www.acm.org>
- IEEE Computer Society, <http://www.computer.org>
- Occupational Outlook Handbook (OOH), 2014-15 Edition, <http://www.bls.gov/oco/>
- <http://www2.cs.uh.edu/gaann/>
- National Association of Colleges and employers (NACE) <https://www.naceweb.org/research/reports/>