



**Sandia
National
Laboratories**

SAND2013-1073P

Getting a Graduate Degree The Whys and Hows

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Sandia National Laboratories

(Original slides developed in collaboration with Intel)



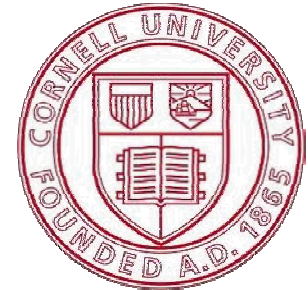
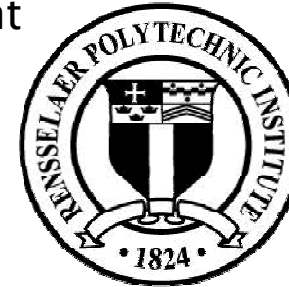
Agenda

- ▶ Speaker introduction
 - Matthew Strosnick
 - Drew Freer
- ▶ Why go to grad school?
 - Reasons from industry experts
 - Reasons from academicians
 - Salary statistics
- ▶ How to get in to grad school?
 - Application
 - Tips
 - Funding (especially Sandia's MFP/CSMP!)

Speaker Introduction



- ▶ Matthew Strosnick
- ▶ Sandia National Laboratories in Albuquerque, NM
 - Computer Software Research and Development
- ▶ Cornell University 2011
 - Master's: Computer Science
- ▶ Rensselaer Polytechnic Institute 2010
 - Bachelor's: Computer Science
- ▶ Work: Satellite Ground Systems, Realtime Radar Algorithms, HCI
- ▶ Fun: smoothies, food, exercising, coding, javelin throwing

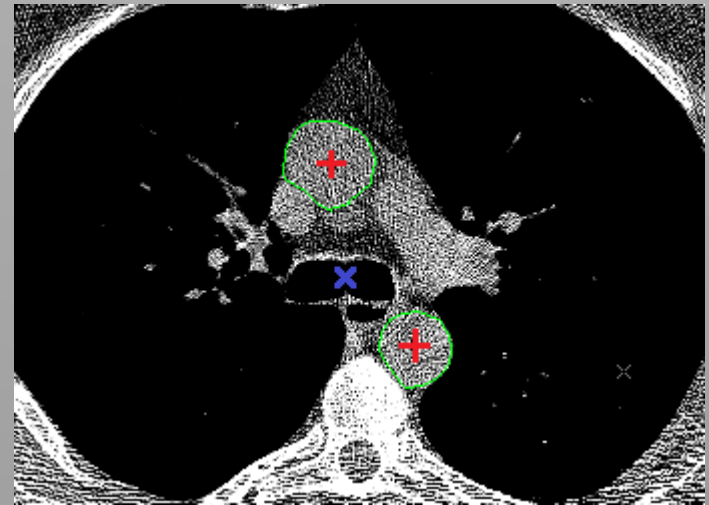


Speaker Introduction

- ▶ Master's Focus: Computer Vision
 - Automatic Descending Aorta Segmentation in Low Dose Computed Tomography Images
 - Automatic Playing Card Detection and Recognition



- Automatic Rectangular Street Sign Detection
- ▶ Undergraduate Research
 - Automatic Scallop Detection and Counting



10/22/2012

Speaker Introduction

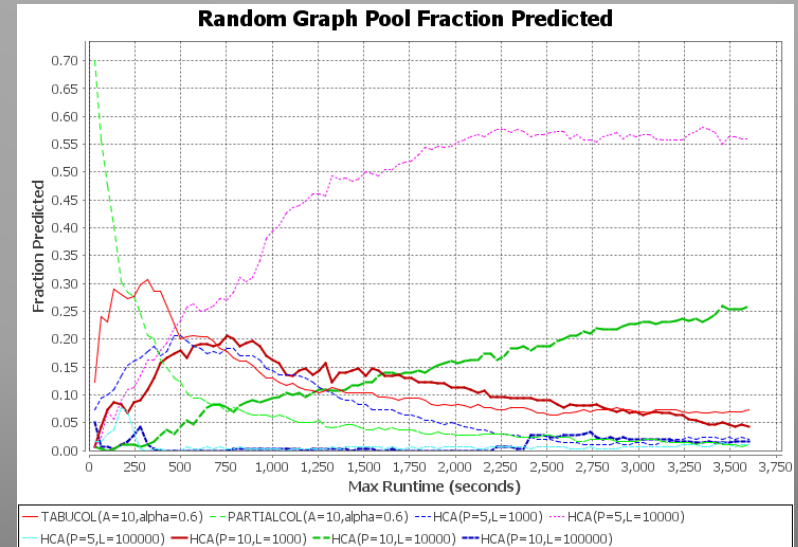
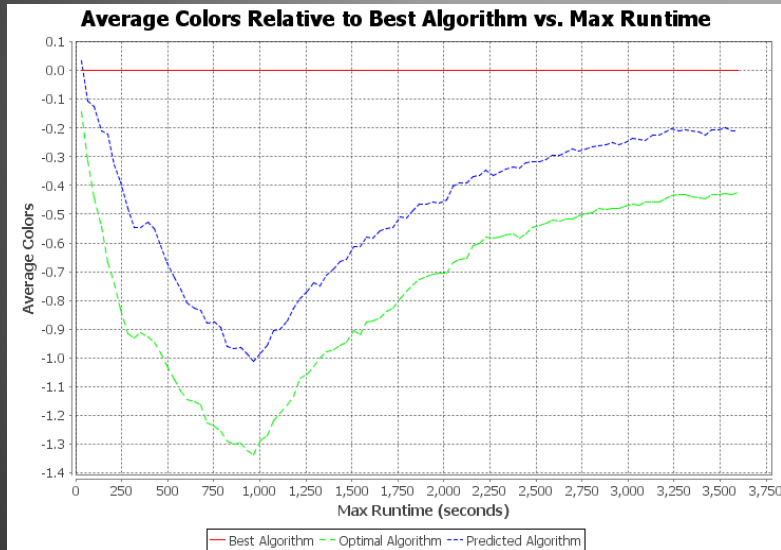


- ▶ Drew Freer
- ▶ Sandia National Laboratories in Albuquerque, NM
 - Computer Science Research and Development
- ▶ UCLA 2012
 - Master's: Computer Science
- ▶ UCLA 2010
 - Bachelor's: Electrical Engineering/Computer Science
- ▶ Work: Satellite Ground Systems, Realtime Radar Algorithms, HCI
- ▶ Fun: surfing, running, ski/snowboarding, Super Smash Brothers



Speaker Introduction

Thesis: “Statistical Heuristic Selection for Graph Coloring”



<http://nerdynerds.net/>

Why Go to Graduate School?

- ▶ Learn more
 - Broaden/flesh out knowledge in field
 - Gain expertise in a subfield
- ▶ Gain credibility
 - Demonstrate ability to create and present project proposals and results
 - Demonstrate ability to solve unstructured problems
- ▶ Do interesting work
 - Collaborate with extraordinary people
- ▶ Higher salaries
- ▶ Have fun

Learn More (and Better!)

- ▶ Target your learning
 - Pick a specialization/focus
 - Choose your advisor
 - Take any class
 - Smaller class size (participate, meaningfully)
 - Research/project-oriented
- ▶ Study under and learn from the top experts
- ▶ Work with students that share your interest

Learn

- ▶ MS and PhD students tackle problems that have never been solved before
- ▶ Create and present your own ideas
 - Presenting skills are important in the real world
- ▶ Become one of the world experts on a particular subject
- ▶ Specialized knowledge in your field gives you:
 - Competitive advantage in the job market
 - More responsibility right away in your new job

Learn: Applied

- ▶ MS/PhDs have CONTROL & OPPORTUNITY

“I got a Ph.D. to have more control over how I spend my work time. With a Ph.D., I get to choose what I research, what service activities I do, which people I want to collaborate with. A Ph.D. opens many doors and also lets you into the international research community.”

- Dr. Sally McKee, Assistant Professor,
Electrical and Computer Engineering Cornell University

Credibility

- ▶ To an employer, a bachelor's degree only proves that you have a basic skillset
- ▶ It may take years to prove your ability to earn more than basic tasks

Credibility

- ▶ MS/PhDs try out THEIR OWN IDEAS

“As a chemist, working as a Bachelor of Science meant I was a test-tube washer and a technician who sat in the lab and did as I was told by a Ph.D. If you want freedom to do what you want to do, to explore your own creativity rather than contribute to the execution of someone else’s ideas, you need to get the degree.”

- Dr. Grant Willson, Professor of Chemical Engineering,
University of Texas at Austin

Credibility

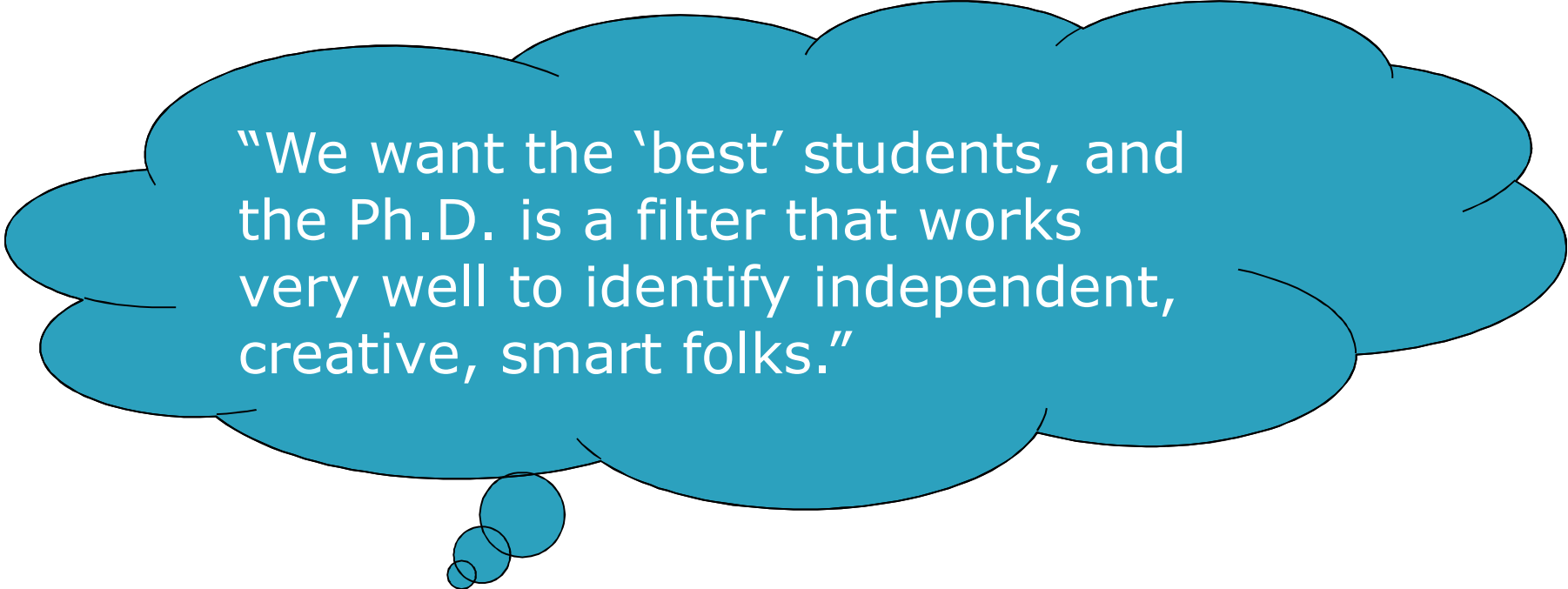
- ▶ MS/PhDs are PROBLEM SOLVERS

“Ph.D.s have already demonstrated an ability to commit to challenging, long-term projects. ... Ph.D. students from good universities have demonstrated the ability to think both independently and originally.”

– Dr. Kelin Kuhn, Intel Device Manager 45nm CMOS technology

Credibility

- ▶ A MS/PhD degree signifies CREDIBILITY



“We want the ‘best’ students, and the Ph.D. is a filter that works very well to identify independent, creative, smart folks.”

– Dr. Kevin Kahn, Intel Senior Fellow and Director,
Communications Technology Lab

Interesting Work

- ▶ Design technology that you will see in the marketplace in 5–10 years
- ▶ Use your free and independent thinking to change the world
- ▶ Develop products that make people's lives better
- ▶ To be a researcher, most industrial R&D labs and most of academia require a graduate degree

Interesting Work: Applied

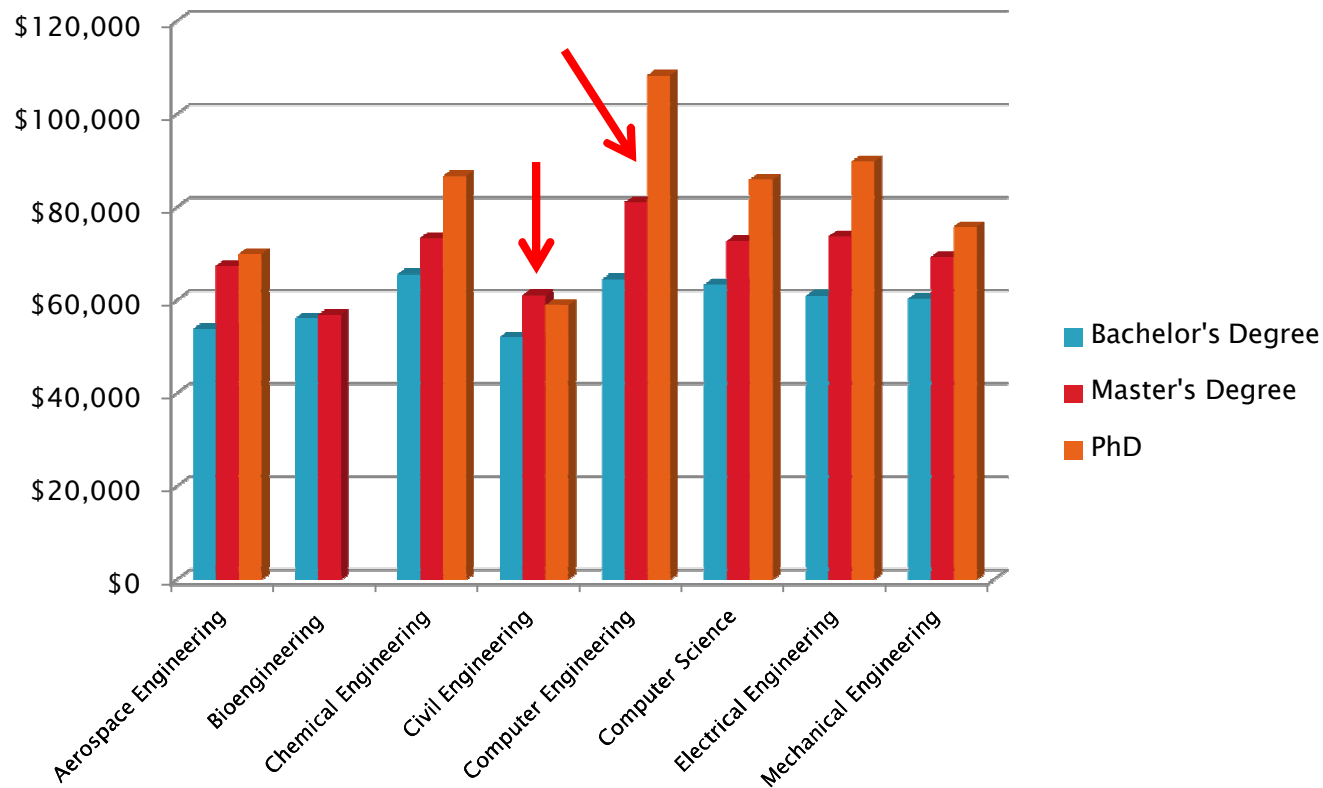
- ▶ MS/PhDs develop BREAKTHROUGH INNOVATIONS

“We consistently see a disproportionate fraction of breakthrough innovations in computer systems from people with a Ph.D. or with Ph.D. training. Some examples: Craig Barrett (Intel), Andy Grove (Intel), Sergey Brin (Google), Mendel Rosenblum (VMWare), John Hennessey (Stanford), Robert Chau (Intel), Richard Wirt (Intel), among the names some of us will recognize.”

- Dr. Brad Chen, Co-Director,
Performance Tools Lab Intel Software and Solutions Group

Salaries

NACE Average Salary Offer, Summer 2011



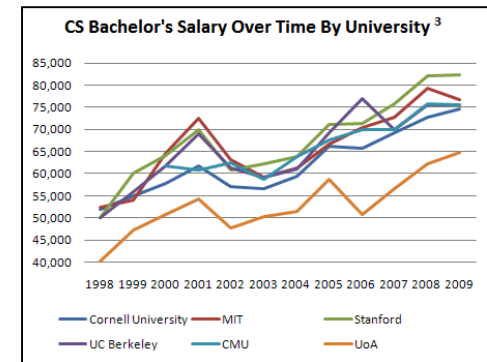
	Aerospace Engineering	Bioengineering	Chemical Engineering	Civil Engineering	Computer Engineering	Computer Science	Electrical Engineering	Mechanical Engineering
Bachelor's Degree	\$53,887	\$56,158	\$65,617	\$52,069	\$64,499	\$63,402	\$61,021	\$60,345
Master's Degree	\$67,443	\$56,900	\$73,400	\$61,102	\$81,083	\$72,727	\$73,715	\$69,326
PhD	\$70,000		\$86,686	\$59,000	\$108,333	\$85,909	\$89,862	\$75,800

Salaries

- ▶ School ranking skews general numbers²
 - ASU (\$44,500 starting, \$79,900 mid-career)
 - UNM (\$40,500 starting, \$73,500 mid-career)
 - Stanford (\$58,200 starting, \$112,000 mid-career)
 - Princeton (\$69,700 starting, \$115,000 mid-career)

- ▶ Salaries for MIT graduates¹

- MIT, Computer Science 2011
 - Mean: \$87,280 (BS) \$109,077 (MS)
- MIT, Engineering 2011
 - Mean: \$63,690 (BS) \$76,377 (MS)



1. <http://gecd.mit.edu/resources/data>
2. <http://www.payscale.com/best-colleges/top-us-colleges-graduate-salary-statistics.asp>
3. <http://elliottback.com/wp/computer-science-salaries-which-university-is-best/>

How to Get in to Grad School?

- ▶ Applying
- ▶ Tips for undergrads
- ▶ Financial aid, fellowships
- ▶ MFP/CSMP
 - Want to get paid to go to grad school?
 - No, seriously.
- ▶ Resources (for lazy Googlers)

Applying

- ▶ Get these requirements ASAP:
 - 3 Letters of Recommendation (Start asking early!)
 - GRE Scores (GRE Subject Test may or may not be required)
 - Write your statement of purpose (Get it reviewed!)
- ▶ Apply for Scholarships
 - Generally separate from the normal application
- ▶ Deadlines Come Quick!
 - Stanford CS: December 11, 2012
 - UC Berkeley CS: December 13, 2012
 - Carnegie Mellon CS: December 14, 2012
 - Cornell CS: December 15, 2012
 - MIT EECS: December 15, 2012

Tips for Undergrads

- ▶ Try out research as an undergraduate
 - You'll get to see if you like doing research
 - Looks great on a Grad School application
 - Your advisor can write a better letter of recommendation
 - You could get academic credit or paid to do research
 - This research is best done late Soph., Jr. or early Sr. year
- ▶ How to get involved in undergraduate research?
 - Talk to professors!
- ▶ Keep your GPA up (GPA matters)
 - This will help when applying to top universities (+jobs)
- ▶ Pick the right program before applying
 - Go to the website of the University you are interested in. There will be specific details on the graduate program.

Financial Aid

- ▶ Financial aid
- ▶ Work opportunities
 - UCLA: <http://www.gdnet.ucla.edu/asis/entsup/ta-rashp.htm>
 - Teaching assistantships
 - Research assistantships
 - Readers/graders
- ▶ Fellowship/Scholarships
 - University-specific
 - National: NSF, GEM, SRC, ...
 - See next slide
- ▶ In engineering and some of the sciences, there is opportunity for funding

Fellowships

- ▶ UCLA Graduate Division fellowships and grants for grads
 - <http://www.gdnet.ucla.edu/asis/entsup/fellgrnt.htm>
 - Graduate Opportunity Fellowship Program (GOFP)
 - Paulson Scholarship Fund (for Swedes)
 - Werner R. Scott Fund (for Hawaiians)
- ▶ AAUW
 - Advancing Educational Opportunities for Women and Girls
 - <http://www.aauw.org>
- ▶ GEM
 - National Consortium for Graduate Degrees for Minorities in Engineering and Science
 - <http://www.gemfellowship.org/>
- ▶ National Physical Science Consortium (NPSC)
 - <http://www.npsc.org/>
- ▶ National Science Foundation Graduate Research Fellowship
 - <http://www.nsf.org>
- ▶ National Defense Science and Engineering Graduate Fellowship (NDSEG)
 - <https://ndseg.asee.org/>

Financial Aid/Fellowships

- ▶ Bottom line: it's out there.
- ▶ There are some really great options for graduate students in particular...

Sandia MFP/CSMP

- ▶ MFP: Master's Fellowship Program
- ▶ CSMP: Critical Skills Master's Program
- ▶ Benefits
 - Pursue Master's degree on full-time basis
 - Annual stipend and most regular employee benefits
 - Payment of full tuition and tuition associated costs
 - Relocation and campus visit
 - Upon successful completion, return to Sandia with appropriate placement and competitive salary
- ▶ Personal Experience
 - Having funding taken care of is nice
 - Sandia is a great place to work, and provides direction and focus to your studies

Questions?