

E11 – Autonomous Vehicles

Engineering and Computer Science Outlooks



Overview

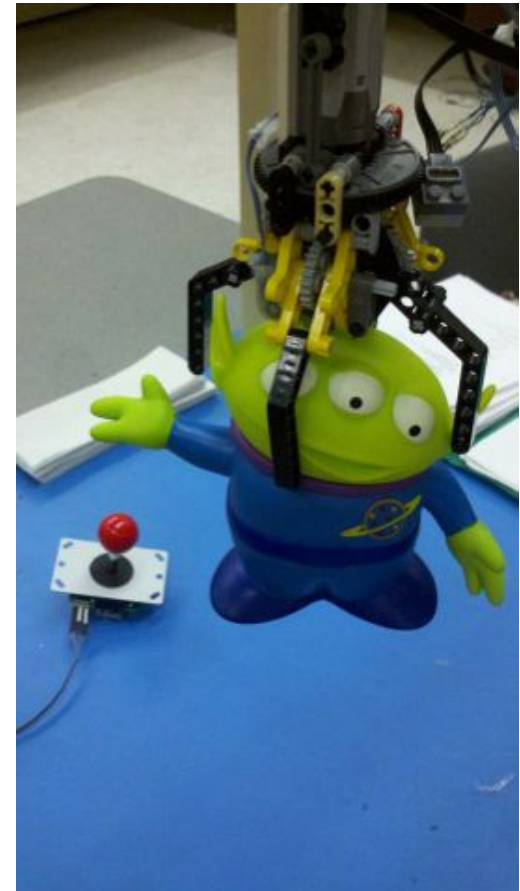
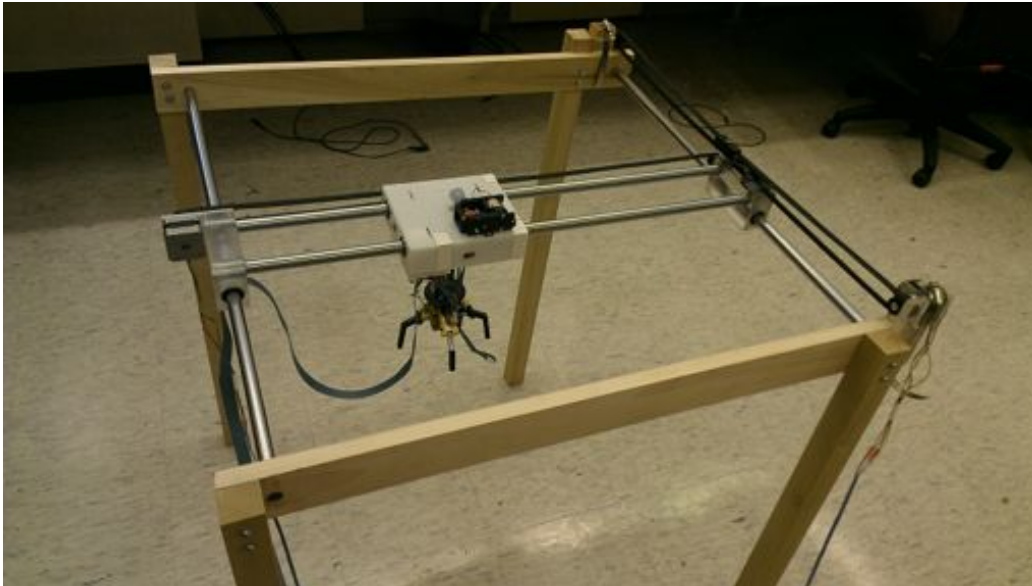
- Engineering and CS @ HMC
- Jobs Today
- The Best Jobs
- Venues
- Jumping Ship

Engineering @ HMC

- Why I chose Engineering
- Best Parts of Engineering
- Worst Parts of Engineering

Engineering @ HMC

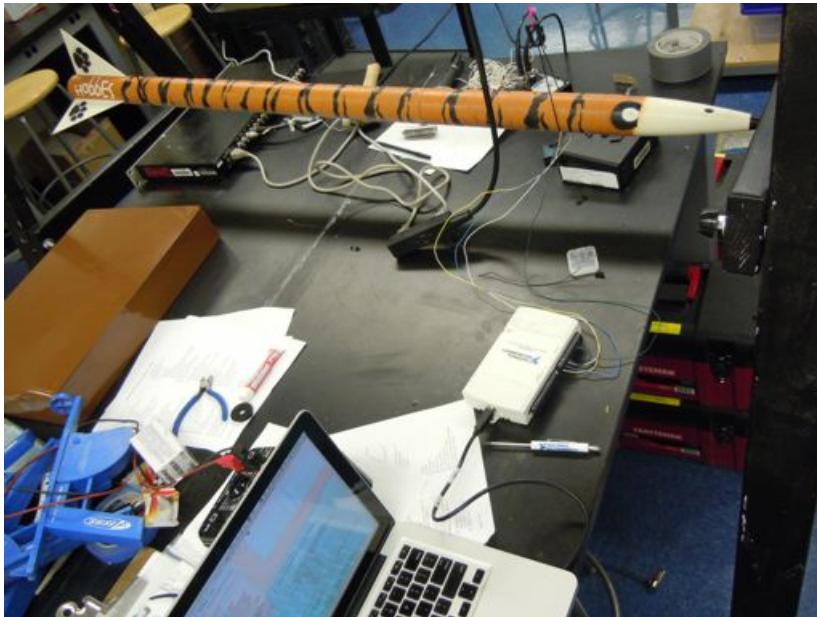
- Highlights:
 - MicroPs



<http://www.youtube.com/watch?v=4uBzQt8p93M>

Engineering @ HMC

- Highlights:
 - E8o



Engineering @ HMC

- Highlights: E8o



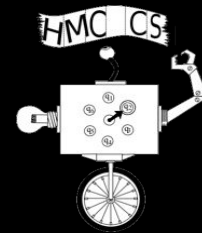
Engineering @ HMC

- Highlights:
 - Choice Lab



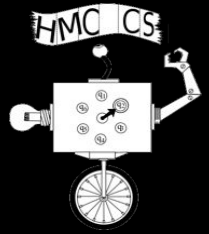
<http://www.youtube.com/watch?v=rX-yrE1iTMU>

Computer Science @ HMC

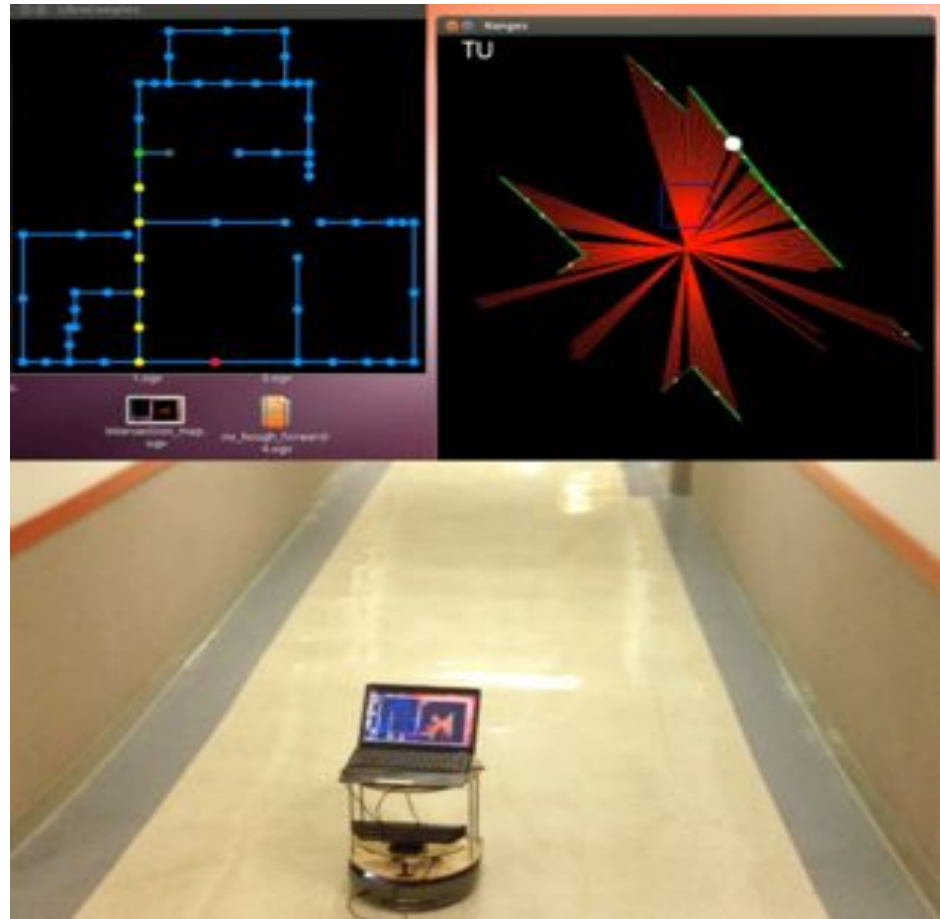


- Why I chose Computer Science
- Best Parts of Computer Science
- Worst Parts of Computer Science

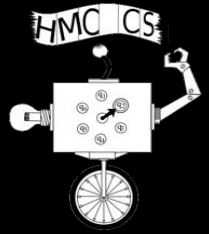
Computer Science @ HMC



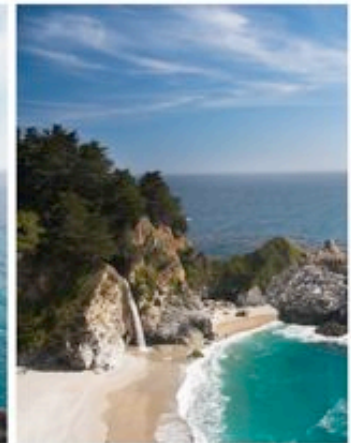
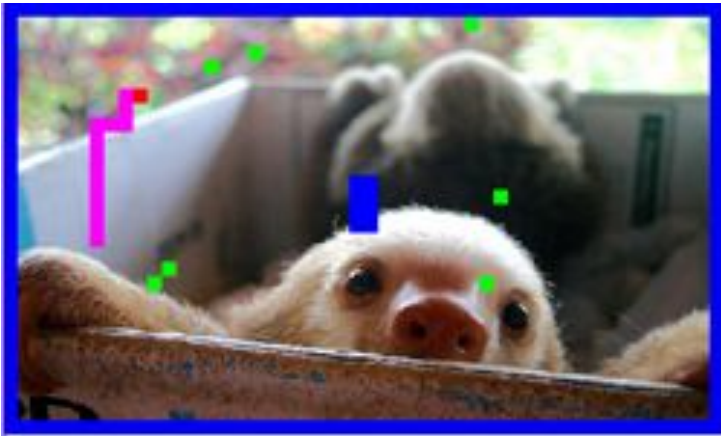
- Highlights:
 - Choice Lab



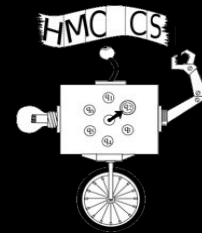
Computer Science @ HMC



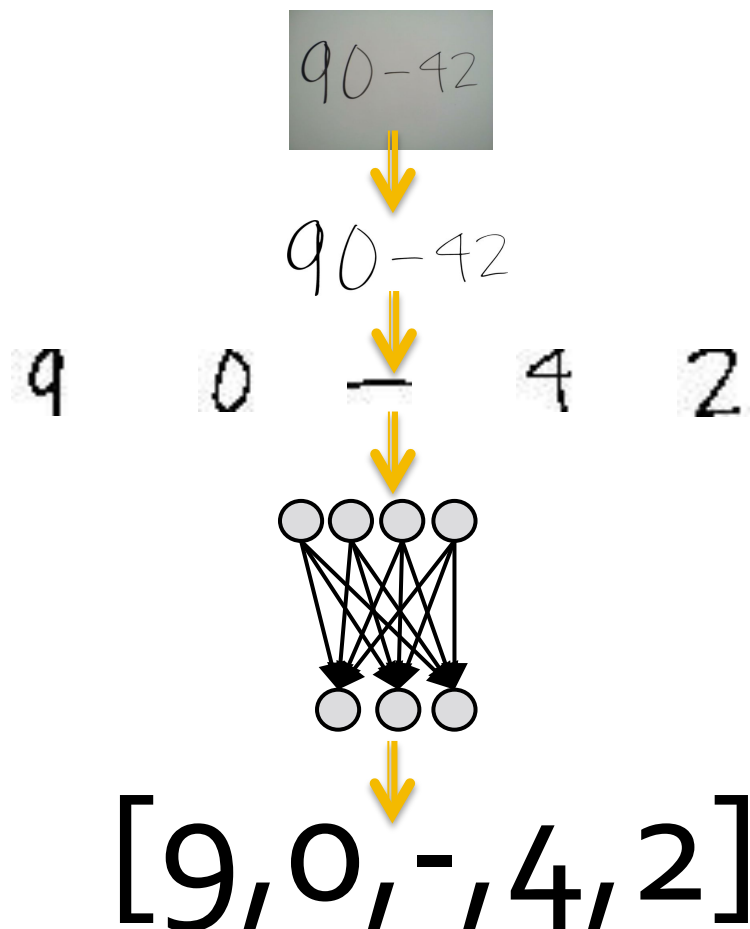
- Highlights: CS 6o



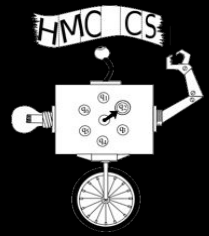
Computer Science @ HMC



- Highlights: Neural Networks



Computer Science @ HMC



■ Highlights: Computer Systems

```
0048fa0: <getbuf>:
0048fa0: 55                push    %ebp
0048fa1: 89 e5             mov     %esp, %ebp
0048fa3: 83 ec 24          sub     $0x24, %esp
0048fa6: 8d 45 f4          lea     -0xc(%ebp), %eax
0048fa9: 50                push    %eax
0048faa: e8 f5 fd ff ff    call    0048da4 <Gets>
0048faf: b8 01 00 00 00    mov     $0x1, %eax
0048fb4: c9                leave
0048fb5: c3                ret
0048fb6: 66 90             xchg    %ax, %ax

# Exploit String:
# b8 88 4f e2 5e bd 28 b7 ff ff 68 ca 8f 04 08 c3 fc b6 ff ff
```

IDIOT.IDIOT.IDIOT.EDU@cs.hmc.edu
to undisclosed recipients ▾

LKJL;KJLKJ

LKJL;J

AND THEN THERE WAS A QUIZ.

ALL IN AFTERNOON CLASS GOT A 10 BECAUSE THEY
SHOWED UP ON TIME!!!

HA HA

Overview

- Engineering and CS @ HMC
- Jobs Today
- The Best Jobs
- Venues
- Jumping Ship

Best Jobs in America


Systems Engineer
 Information Technology (IT) (20,000)
 \$87,100 | \$138,000


Physician Assistant
 Healthcare (20,000)
 \$90,800 | \$124,000


College Professor
 Education (20,000)
 \$70,400 | \$115,000


Nurse Practitioner
 Healthcare (20,000)
 \$85,200 | \$113,000

Key

 Top 50 Best
 Job Title
 Median salary | Top pay

Selected featured areas

- Highest paid salary
- Highest median salary
- Best flexibility
- Most satisfaction
- Lowest turnover
- Highest job growth
- Highest pay slope
- Most security
- Active growth


IT Project Manager
 IT (14,000)
 \$98,700 | \$140,000


Certified Public Accountant
 Financial (14,000)
 \$74,200 | \$138,000


Physical Therapist
 Healthcare (14,000)
 \$74,300 | \$98,100


Computer/Network Security Consultant
 IT (14,000)
 \$99,700 | \$152,000


Intelligence Analyst
 Government (14,000)
 \$82,500 | \$115,000


Sales Director
 Sales and Marketing (10,000)
 \$145,000 | \$235,000


Anesthesiologist
 Healthcare (10,000)
 \$292,000 | \$408,000


Software Developer
 IT (10,000)
 \$79,400 | \$116,000


Pharmacist
 Healthcare (10,000)
 \$109,000 | \$134,000


Occupational Therapist
 Healthcare (10,000)
 \$69,700 | \$98,000


Nurse Anesthetist
 Healthcare (10,000)
 \$157,000 | \$214,000


Software Product Manager
 IT (10,000)
 \$106,000 | \$148,000


Business Analyst, IT
 IT (10,000)
 \$82,000 | \$119,000


Attorney/Lawyer
 Legal (10,000)
 \$115,000 | \$262,000


Physician/General Practice
 Healthcare (10,000)
 \$150,000 | \$228,000


Human Resources Manager
 Office (10,000)
 \$71,800 | \$111,000


Senior Financial Analyst
 Financial (10,000)
 \$79,800 | \$109,000


Physician/Gynecologist/Gynecologist
 Healthcare (10,000)
 \$222,000 | \$338,000


Clinical Psychologist
 Healthcare (10,000)
 \$81,100 | \$172,000


Psychiatrist
 Healthcare (10,000)
 \$177,000 | \$279,000


Veterinarian
 Office (10,000)
 \$83,900 | \$157,000


Telecommunications Network Engineer
 IT (10,000)
 \$86,200 | \$136,000


Securities Trader
 Financial (10,000)
 \$113,000 | \$497,000


Education/Training Consultant
 Financial (10,000)
 \$77,800 | \$137,000


Emergency Room Physician
 Healthcare (10,000)
 \$248,000 | \$386,000


Product Management Director
 Sales and Marketing (10,000)
 \$141,000 | \$281,000

Jobs Today

CNNMoney
A Service of CNN, Fortune & Money

PORTUNE - Money -

U.S. - Log In - CNN

Home Video Business News Markets Investing Economy Tech Personal Finance Small Business Leadership

Business School Careers Management Strategy

IBM FOR MIDDLE BUSINESS
From Limited I.T. Resources
to Unlimited Potential.
Expand to learn
more about the
IBM SmartCloud.
IBM

10 hot careers for 2012 - and beyond

December 27, 2011 3:15 PM EST

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Hiring overall probably won't pick up much next year, but there are pockets of prosperity even in this job market. Here's where the most opportunities are now.

By **Anne Fisher**, contributor

FORTUNE -- Strange but true: Despite the fact that unemployment is stuck at around 9%, which translates to about 15 million Americans out of work, nearly 3 million job openings in the U.S. are going unfilled, according to the Bureau of Labor Statistics. Why? The biggest reason is a mismatch between the qualifications employers are looking for and the skills job hunters have.

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Select a Loan	Rate	APR
30 Year Fixed	3.50%	3.66%
15 Year Fixed	2.75%	3.00%
5/1 ARM	2.62%	3.23%

Jobs Today

- CNN article...

1. **Information technology.** When career site Indeed.com recently analyzed millions of job postings on its web site, researchers found that the fastest-growing category of keywords — including HTML5, Android, mobile app, and social media — were in IT, and a new survey by tech job site Dice.com bears that out. About 65% of hiring managers said they hope to add tech staff in the first half of 2012. Roughly a quarter of those (27%) said they want to expand their IT headcount by more than 20%.

Openings for software developers who specialize in applications will rise by more than one-third (34%) by 2018, says *Best Jobs for the 21st Century*, a new book by job market analyst Laurence Shatkin, while companies will hire 20% more computer systems analysts. Rising pay in these fields reflects the surge in demand: The Bureau of Labor Statistics says that developers of systems software, for instance, earn an average of \$94,150 per year.

Jobs Today

- CNN article...

4. Engineers. Note to college students who want their pick of job offers when they graduate: Consider majoring in engineering. A whopping 88% of employers in a new poll by the **Society for Human Resource Management** bemoaned the difficulty of finding enough engineers to hire. Civil engineers are in demand too: Shafkin's analysis of BLS data shows a 24.3% spike ahead in jobs for people who design roads, bridges, and other infrastructure projects (average annual pay: \$17,560).

Engineering vs. Computer Science

Occupational Distribution of STEM Jobs through 2018						
	COMPUTER OCCUPATIONS*	ENGINEERS & TECHNICIANS	LIFE & PHYSICAL SCIENCE OCCUPATIONS	ARCHITECTS, SURVEYORS & TECHNICIANS	MATHEMATICAL SCIENCE OCCUPATIONS	TOTAL†
Number of jobs	183,750	75,340	31,210	19,840	9,670	319,820
% of all STEM jobs	57%	24%	10%	6%	3%	100%

*Computer Technicians, Programmers, and Scientists

† Totals may differ slightly due to rounding

Best Jobs?

BEST JOBS IN AMERICA

ChildMoneyPayScale.com's list of great careers

2012

1. Biomedical Engineer

1 of 100

BACK

NEXT



4.2k



200



100



10



Print

Median pay: \$79,300

Top pay: \$124,300

18-year job growth: 31.7%

Total jobs*: 15,720

What they do all day? Science fiction is a little less fictional in the day-to-day work of biomedical engineers, who design prosthetic limbs and artificial organs or regenerate tissue. They also create drug formulations, develop pharmaceuticals or collect and analyze biological data, among other work. In this field lies the intersection of biology and engineering skills, which helps crack tough problems in medicine and health.



How to get the job? A bachelor's, master's or Ph.D. in biological engineering will get prospects in the door, but engineers with more traditional degrees — such as electrical, mechanical and chemical — are also a good fit.

What makes it great? Not only is it one of the highest-paid engineering jobs, it's a career that gives back to society by helping to improve world health. It's also highly flexible, with positions in universities, hospitals, labs, industry and regulatory agencies.

What's the catch? Rapid technological changes mean engineers have to work hard to stay abreast of new developments — so this isn't the field for those looking to coast through their careers. —Katy Ashford

Quality of life ratings:

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

Best Jobs?

BEST JOBS IN AMERICA

CNNMoney/PayScale.com's list of great careers

2010-11

3. Software Architect

1 of 100

BACK

NEXT

Facebook

144

Twitter

StumbleUpon

44

LinkedIn

14

Google Plus

Median pay: \$119,000

Top pay: \$162,000

10-year job growth: 24.0%

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.



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 fire on both sides is crucial. —T.Z.

Quality of life ratings:

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

Best Jobs?

BEST JOBS IN AMERICA

ChildMoneyPayScale.com's list of great careers

2. Software Developer

4 of 100

BACK

NEXT

Facebook

Twitter

StumbleUpon

LinkedIn

Print

Median pay: \$64,200
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.

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	Benefits to society	Flexibility
B	B	C	B



Venues

- Startup
- Small High-Tech Company
- Large High-Tech Company
- Academic
- Government
- Graduate School

Venues

■ Startup Companies

- E.g. Kiva, DocSpace, Aeryon, Gaming, OBEI, ...
- Low level of job security
- Hard work
- Exciting
- Large variety of tasks
- Highly Creative



Kiva Systems



Venues

- **Small High Tech**
 - E.g. RTI, Sterner Automation
 - Increased Job security
 - Reasonable work level
 - Still can be Exciting
 - Typically one task, but can see relations with entire company
 - Often focus on 1-2 products



*Real Time Innovations –
European Southern Observatory*

Venues

- **Large High Tech**
 - E.g. Lockheed Martin, Google, 3M, Solutia
 - High level of job security
 - Reasonable work level
 - Much room for lateral movement within co.
 - Typically one task
 - Often difficult to see big picture



Lockheed Martin - AUV



Venues

■ Academia

- E.g. Harvey Mudd College!
- Higher job security (with tenure)
- Unreasonable work level
- High level of creativity
- Very flexible
- Very difficult to obtain



Princeton University

Venues

■ Government

- E.g. DARPA, Navy, CIA, ...
- Higher job security
- Reasonable work level
- Inflexible
- Could be best job ever (but I couldn't tell you!)



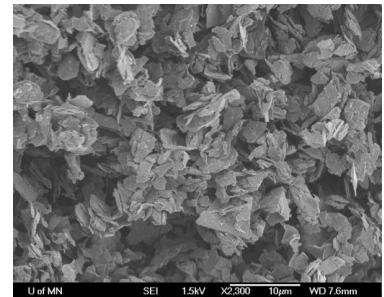
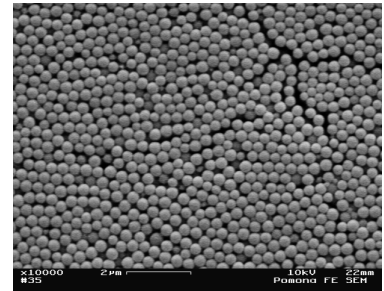
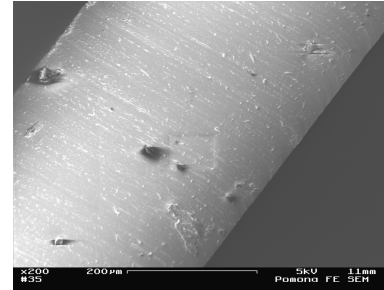
Central Intelligence Agency

Venues

- Graduate School
 - Flexible
 - Low pay
 - Highly Creative
 - Empowering environments
 - Stepping Stone?



*Aerospace Robotics Lab –
Stanford University*



*Cussler Research Group –
Univ. of Minnesota*

Jumping Ship

- Many people transition from their undergraduate education
 - Medicine
 - Law School
 - Wall Street
 - ...



Quansar Haptics