This Talk is NOT About

Resume writing
Job search strategy
Salary negotiation
Agenda

The State of STEM Employment
Responding to the Recession of 2008
Learning from Our Engineering Past
5 actions to be Hirable for Life™
Capitalizing on Downturns
Conclusion
Q&A
Terms

STEM: Science, Technology, Engineering, Mathematics

S&E: Science and Engineering

R&D: Research and Development
US Unemployment Rate by Education Level

Source: The Atlantic 9/9/2011
The State of S&E Workers in the US

During Every Downturn

The phone calls come
Some had warning
Most get severance
Few are surprised (in hindsight) or angry
All are concerned
The Longer You’re Unemployed, the More Likely You are to Stay Unemployed

US workforce by year: Percentage of unemployed who have been unemployed for the specified duration (left axis). Number of transitions from unemployed to employed (right axis). [10]
The Illusion of Stability

What is more stable?

- A job at a large company
- A government job
- An “overseas” position at a multinational corporation
- An independent contractor position

Who is prepared for a sudden career “stress-test?”

- Large-company employee
- Government employee
- Low-cost overseas employee with multinational experience
- Independent contractor
“The Great Recession lost many more jobs than the past few recessions, and it's recovering much slower.”

Source: The Atlantic 9/9/2011
The Great Recession is/was Tough

Senior engineers
Managers
Directors
VPs

Even Senior Fellows!

When your company goes away, your job goes away
Change is Swift, for Products and Personnel

HP’s TouchPad cancelled after 2 months on the market

HP’s CEO, Leo Apotheker, replaced after 11 months
The Truth

Nobody owes us a job

What we love to do must be (and remain) relevant to those who will pay for it
Utilize the greatest engineering tool:

The worked example!
Hiring surge brings recruiters to Bay Area campus job fairs

By Lisa M. Krieger

lkrieger@mercurynews.com

Posted: 04/20/2011 01:36:07 PM PDT

After years of gloom, college students are flocking to campus job fairs this month in what is shaping up to be the best job hunting season since the Class of 2008.

Universities all over the Bay Area report an increase in the number of recruiters seeking to fill entry-level jobs and internships -- brightening prospects for students whose entire adult lives have been clouded by the Great Recession.

As commencement approaches, 148 recruiters are visiting UC Berkeley this week at a job fair so big that it was turned into a two-day event -- for the first time since 2008. More than 1,500 students are expected to attend.
Good new-graduates from good engineering schools are typically “Very Hirable”
Why are New Engineering Grads “Very Hirable?”

Up-to-date skills

Good value

“Recommended” (GPA) by someone they trust (the university)

Demonstrated results (graduation)

Easy to find
“The only thing that is constant is change.”
Change is Accelerating

Experienced engineers must compete with new grads and outsourcing today

However, the new grads and lower-cost labor of today will face similar competition in the coming years

Only FASTER!
College Education’s Shelf Life

A lifetime?

About 10 years?

When is “mid-career?”
A Recent Job Posting on the Web

Location: San Diego, CA
Job Type: Full-Time/Regular
Level of Education: BA/BS
Salary: Negotiable
Job Level: Mid Career (2+ years of experience)
Date Updated: 06-23-2009
Number Of Openings: 1
Based on the May 12, 2010 keynote address to

The 2010 graduating ECE class at Carnegie Mellon University

Hirable for Life™

A Consultant’s Perspective on Finding and Keeping Work
Technical University of Delft (2011)
The Netherlands
DIMES (2011, Delft)
University of Texas, Dallas (2012)
Hirable by Whom?

A different group within your company

Another company

Another industry

A venture capitalist (to invest in your new business idea)

Your same group – would they re-hire you?

Yourself
Change is Accelerating

Consultants are among the first to see it

My suggestion:
We all must be good at refreshing our “hirability”

Repeatedly and Rapidly
"The future is already here -- it's just not very evenly distributed."

- William Gibson

- Science fiction writer
Preprint available at:
The Unspoken Universal Business Plan

![Graph showing revenue vs. time](image)

- Revenue, Profit
- Time
Realities of the (Bachelor of Science) Engineer’s “Business Plan”

Source: http://wadhwa.com/blog/2010/08/28/silicon-valley%e2%80%99s-dark-secret-it%e2%80%99s-all-about-age/
Realities of the (MS, PhD) Engineer’s “Business Plan”

Realities of the Consulting Business Plan

![Graph showing fluctuations in revenue and profit over time.](Image)
Note

Hirability ≠ Higher Salary
Hirability vs. Salary: Is it This, ...
Hirability vs. Salary: Or This?
Hirability vs. Salary: Probably More Like This!
Hirability $\neq$ Higher Salary

Hirability

= 

More options, enjoyment, “security”
Daniel Pink: The 3 A’s

**Abundance**

Competing with free

**Asia and Automation**

Can what you do be reduced to a sequence of steps?
Wages: International Comparison

Annual salary + bonus + overtime for all engineers surveyed (2010). [12]
Actually, We’re All in this Together

We will ALL compete with

Automation
   Working around the clock
Always getting faster and cheaper (*e.g.*, Moore’s law)
Cloud computing

Instant
Free
Fun (“gamification”)

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5 Actions to Take to Remain Hirable for Life

• Be really good at what you do (become an expert)

• Focus on the customer

• Network selectively and generously

• Make people want to find you

• Be financially able to wait for the opportunity of your choosing
In the Time We have Today

We’ll focus on one of the actions:

Be really good at what you do
Be Really Good at What You Do

Maintain or increase the rate-of-change of your knowledge and experience

Become an **Expert** in your field

- Experts can explain things clearly (e.g., to a bright high school student)
- Experts don’t know EVERYTHING!
- Experts know the “4 corners” of a field
- Experts know the **right questions** to ask

Expand what you consider to be “your field”

- Narrow core expertise, but broad application
Be Really Good at What You Do

Actions You Can Take Now

Ask better questions

Identify and analyze everyday experts around you (How would you like them to behave; how do they behave?)

Write up an explanation and non-trivial worked example for something you like and know well

Revise it many times!

Could YOU understand it as a high school senior?

When you are satisfied

Publish it, post it, record it, translate it, extend it, improve it, make it faster!
Be Good at What You Do: The H4L Goal

Deep expertise that is broadly applicable
How Can You be Sure You’re an Expert?

Explain such that others can explain

Always know the next step (specific action) to take
The Sweet Spot for Explanations

There is plenty of simplified information covering the basics for newcomers.

There is highly specialized knowledge from insiders to insiders (IEEE journals!)

The sweet spot is making difficult concepts understandable, useful, and actionable to intelligent non-specialists.
Experts, Take Note

Who is served by these phrases?

“It’s trivial”

“It’s complicated”

“It depends”
Talking with an Expert involves

Information flow

An expert doesn’t stop at “it depends”
He/she says on what it depends and how it depends, ... and what your options are for next steps

You learn something when you talk to an expert
An Expert of What?

For individuals, your competitive advantage comes from **combining** skills

Find the intersection of your best skills/talents and your strongest passions
Set a Reminder: Expertise
6 Months from Today – October 8, 2013

What was the best explanation you gave over the last 6 months?

How did you measurably deepen your expertise?
   How has this helped your customer?
   How has this helped your employer?
   How has this helped you?

What is your plan to extend your expertise to a new area over the next 6 months?
   How will they (people in that area) know?

On October 8, 2013, set another (different) expertise reminder for April 8, 2014
The Other 4 Actions to Take to Remain Hirable for Life (will have to wait!)

• Be really good at what you do

• Focus on the customer

• Network selectively and generously

• Make people want to find you

• Be financially able to wait for the opportunity of your choosing
How Not to Talk to a Customer

I need someone to teach me MATLAB for an image processing project

What kind of image processing (Enhancement, Segmentation, etc.)?

Project in watermarking

That is an old topic. Go for something new in image processing.

Yes, I agree – You should work on the latest trends in image processing. For basic MATLAB, read the book by ___. There are some institutes that offer classes. You need to concentrate on the latest logic and algorithms in image processing. Programming will not take much effort.
Bonus Section!

Capitalizing on the Next Downturn
Unemployment Subsides more Slowly

Percent Job Losses in Post WWII Recessions

- Current Employment Recession
- Dotted Line ex-Census Hiring

Number of Months After Peak Employment
Percent Job Losses Relative to Peak Employment Month

http://www.calculatedriskblog.com/
In the Downturn

"To wish you were someone else is to waste the person you are."

~ author unknown

You wake up as a degreed, experienced engineer!
% US Unemployed > 6 Months

“Fully 45% of the unemployed have been out of work for more than six months, nearly twice as disastrous as any post-war recession.”

Source: The Atlantic 9/9/2011
Traditional Advice After Losing a Job

You have a job; It is to find a new job!
-- HR professional

For them, the act of finding a job is similar to doing their actual job, so this advice makes sense, ... but not for a STEM worker!
He that will not apply new remedies must expect new evils; for time is the greatest innovator."

--Francis Bacon,
British author and statesman
AntiFragile
(also, at Davos 2013, “Resilient Dynamism”)  

Nassim Taleb (Black Swan author)

Systems should actually take advantage of unexpected events

Small is better

Stability leads to systems that cannot survive shock!
You Have 3 Jobs

1. Traditional job search
2. Create and prepare for a new business
3. Improve your life to create more of you!
The New Retirement Investments

Skills
Education
Network
Health
Santa Clara Metro Area Workshop
September 29, 2012: 1st H4L Class!
Are You Interested?

Please leave your name and email (or business card) with me, if you might be interested in attending a local H4L workshop.

Please contact me if you’d like to schedule a corporate version at your company.
Conclusion

Annual career stress-test exercise

What would your actions be if you lost your job tomorrow?

What actions would you take now if you knew you were going to lose your job in 6 months?

What would your actions be if you knew you would be out of work for 6 to 12 months?
“Stack the Deck” in Your Favor

Society’s or Industry’s Recognized Needs

Build career/business here
What Should be at the Intersection?

Something that is

In demand and

Hard to do

Solve problems that never go away
3 Favors

Join me on social media
Express interest in attending a local H4L workshop
Provide a contact to a company that might want to hold the corporate version of the workshop

Let’s make Dallas where we begin to change engineering and science careers for the better – for the long-term!
Thank you!

Let’s expand our networks:

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www.twitter.com/ChannelScience
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