U.S. Army Research, Development and Engineering Command

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ORAU ORISE (ARL-WMRD) / Faculty, Mississippi State University

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Career Mobility: Personal Experience and Lessons Learned from Industry, Government Laboratories, and Academia

MS&T 2012, Perspectives for Emerging Materials Professionals Symposium
October 9th, 2012

Abstract

11:20 AM Invited

Career Mobility: Personal Experience and Lessons Learned from Industry, Government Laboratories, and Academia: *Mark Tschopp*[1]; [1]Mississippi State University

Early career materials professionals are often faced with a decision early in their undergraduate studies about their future career path. In some cases, this decision sets up their future 30+ year career in industry, government laboratories, or academia. In my case, this decision was only the beginning of a tortuous career path that eventually led to academia and a faculty position. This presentation will share my personal experience with career mobility as I moved from industry to graduate school to government laboratory to academia. I will share some of my experiences with shifting between these very different worlds as well as some of the lessons that I have learned along the way.

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Career Mobility: Personal Experience and Lessons Learned from Industry, Government Laboratories, and Academia: *Mark Tschopp*[1,2]; [1]Mississippi State University, [2]ORAU/ORISE (Army Research Laboratory)

Early career materials professionals are often faced with a decision early in their undergraduate studies about their future career path. In some cases, this decision sets up their future 30+ year career in industry, government laboratories, or academia. In my case, this decision was only the beginning of a tortuous career path that eventually led to academia and a faculty position, and then to a government laboratory. This presentation will share my personal experience with career mobility as I moved from industry to graduate school to government laboratory to academia (and then back to a government laboratory). I will share some of my experiences with shifting between these very different worlds as well as some of the lessons that I have learned along the way.

Objectives

The Search for the Perfect Job:

- Share my experiences as I have transitioned from one position to another
  - what I've learned
  - what has been important for me
- Important to take into consideration many different opinions and make a conscious decision of what is the right fit for you…

Disclaimer: These are candid remarks/lessons learned from my own experiences. These may not be everyone's experiences. Perhaps, these views will spark discussion or encourage thought, though.

w/o visits to parents in IA

2001 Ford Escape

Est. Fuel Cost $1207.00

136 hrs 13 mins / 8259.81 miles

w/ visits to parents in IA

2001 Ford Escape

Est. Fuel Cost $2035.50

228 hrs 2 mins / 13939.71 miles

Takeaway Points:

1. This is why we don't like to travel back home over Christmas break… (for my parents!)

2. Sometimes careers take *tortuous* paths. Be opportunistic and take advantages of opportunities to move your career forward…

3. Experiencing different work environments and cultures is value-added for your career.

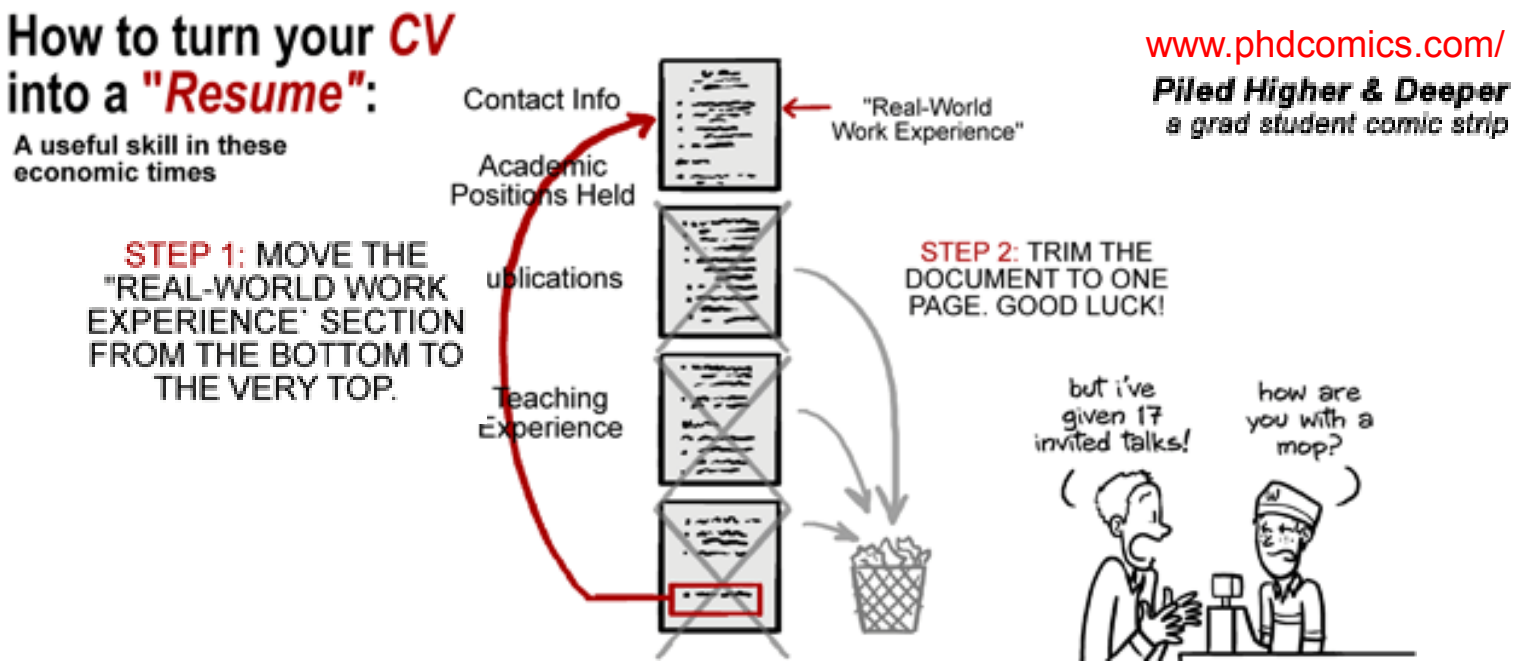
13939.71 miles!

Keep your options open!

It all starts with a Resume…

How do you market yourself?

What you don't want to have happen…



www.phdcomics.com/

Piled Higher & Deeper
a grad student comic strip

Have a plan of where you want to go!

It all starts with a Resume…

How do you market yourself?

Mark A. Tschopp

CONTACT INFORMATION

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Center for Advanced Vehicular Systems, PO Box 5405
Mississippi State University, MS 39762
Email: mtschopp@cavs.msstate.edu
Work Phone: (662) 325-5580
h-index: 11 (Google Scholar, Scopus & ResearcherID)

EDUCATION

Georgia Institute of Technology, Atlanta, Georgia USA

Ph.D., Materials Science and Engineering, Summer 2007, GPA 3.9/4.0

- Ph.D. Dissertation: M.A. Tschopp, "Atomistic simulations of dislocation nucleation in single crystals and grain boundaries," pp. 1-375 (2007), 2008 Sigma Xi Best PhD Thesis Award.
- Advisor: David L. McDowell, Regents' Professor and Carter N. Paden, Jr. Distinguished Chair in Metals Processing for MSE/ME

University of Missouri-Rolla, Rolla, Missouri USA
(now) Missouri University of Science & Technology

M.S., Metallurgical Engineering, December 1999, GPA 4.0/4.0

- M.S. Thesis: M.A. Tschopp, "Mechanisms of the formation of pyrolysis defects in aluminum lost foam castings," pp. 1-255 (1999).
- Advisor: Donald Askeland, Distinguished Teaching Professor for Metallurgical Engineering

B.S., Metallurgical Engineering, May 1998, GPA 3.9/4.0

EMPLOYMENT

Research Scientist (on leave of absence from MSU) — **2012-Present**
Oak Ridge Institute for Science and Education, Aberdeen, MD
Weapons and Materials Research Directorate, Lightweight and Specialty Alloys
Army Research Laboratory

Adjunct Assistant Professor, **Mechanical Engineering** — **2009-Present**
Adjunct Professor, **Computational Engineering**
Mississippi State University

Assistant Research Professor — **2009-Present**
Center for Advanced Vehicular Systems, Mississippi State University

Visiting Research Scientist — **2007-2009**
Universal Technology Corporation, Dayton, Ohio
(on site at) Wright Patterson AFB, Air Force Research Laboratory
Life Prediction and Behavior Group (RXLMN)

Graduate Research Assistant, **Georgia Institute of Technology** — **2003-2007**

Process/Manufacturing Engineer — **2000-2003**
GM Powertrain–Casting Development and Validation Center

Graduate Research Assistant, **University of Missouri-Rolla** — **1998-1999**

Manufacturing Engineer, **GM Powertrain–Massena** — **1998**

HONORS AND AWARDS

- 2011 MSU StatePride Faculty Award
  - Award based on excellence in teaching, research, and service to Mississippi State University.

Like my CV template? Here's the LaTeX:
http://www.cavs.msstate.edu/mtschopp

BS/MS

- Fit everything into 1-2 pages
- Focus on grades, work experience, skills

PhD/PD/+

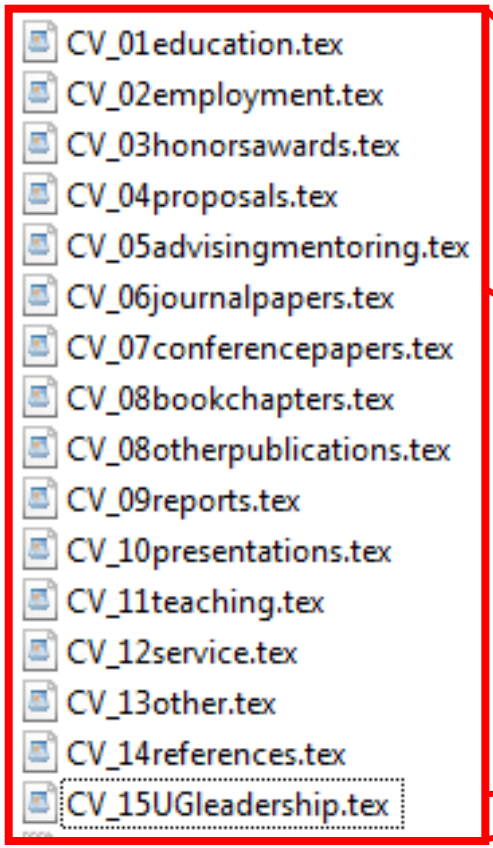
- Develop your CV => Roadmap
- How does what you are working on translate to your CV?

How do I improve my Resume/CV?

- Find online examples – What do you like? What don't you like?
- Find successful people in your discipline – What roadmap did they follow? What can you learn from their career path?

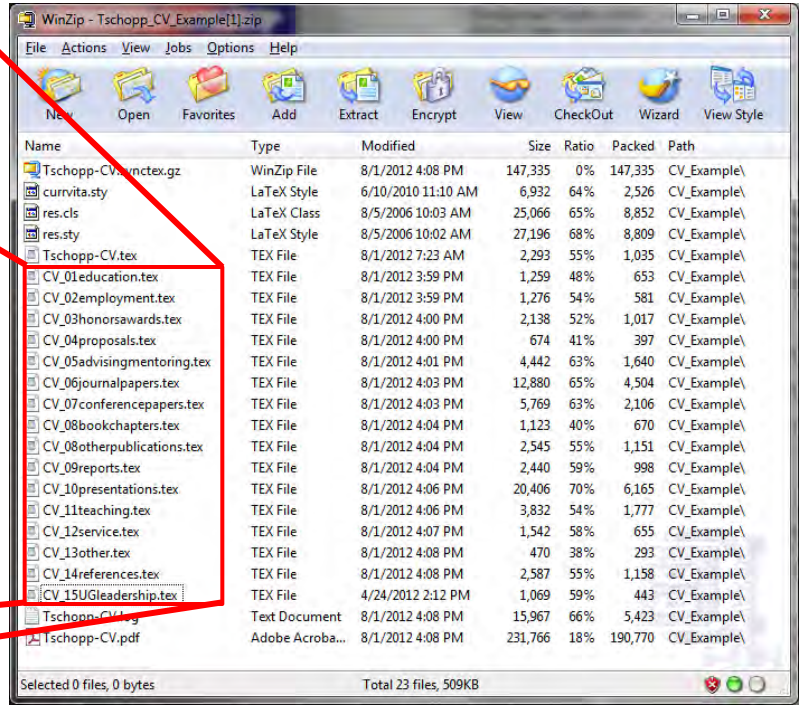
It all starts with a Resume…

How do you market yourself?



Why I like LaTeX…

- I can keep track of everything, but I can comment out items (or keep track of things that don't need to be in my CV)



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It all starts with a Resume…

How do you market yourself?

Journal Articles

Why I like LaTeX…

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LaTeX

```
\item
\underline{Barrett, C.D.}, Tschopp, M.A., El Kadiri, H.,
``\href{http://dx.doi.org/10.1016/j.jmps.2012.06.015}{Breakdown of the Schmid Law in
Homogeneous and Heterogeneous Nucleation Events of Slip and Twinning in Magnesium}," Journal
of the Mechanics and Physics of Solids, doi:10.1016/j.jmps.2012.06.015.
% From Kip 6/1/11
% Reviewed and back to Kip 7/1/11
% Haitham's comments. 7/21/11
% My comments, 8/7/11
% To Heather, 8/8/11
% Reviews back, 12/13/11
% in press, 8/2/12
```

Make notes about when I sent to collaborator/journal, when they accepted it, when in print, etc.

Compiles into this…

pdf

Barrett, C.D., Tschopp, M.A., El Kadiri, H., "Breakdown of the Schmid Law in Homogeneous and Heterogeneous Nucleation Events of Slip and Twinning in Magnesium," Journal of the Mechanics and Physics of Solids, doi:10.1016/j.jmps.2012.06.015.

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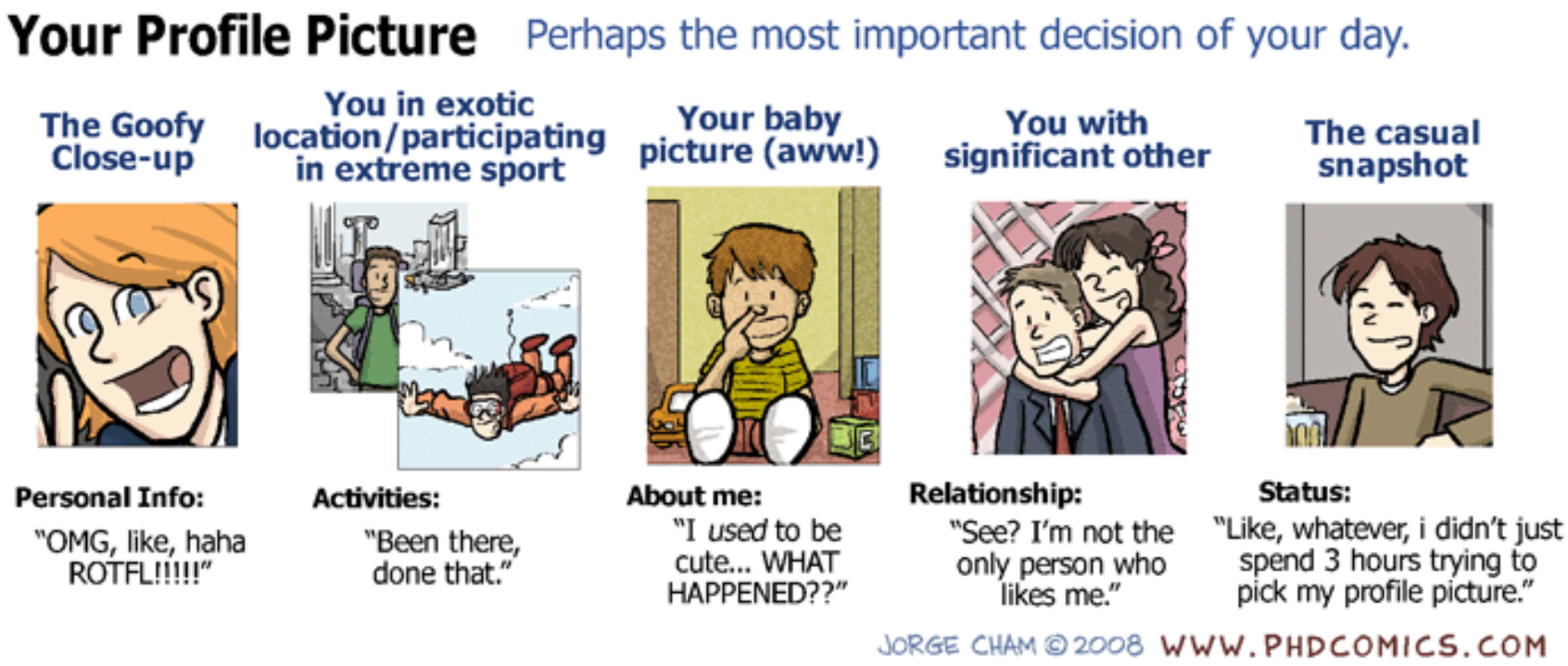
Be conscious of online persona…

How do you market yourself?



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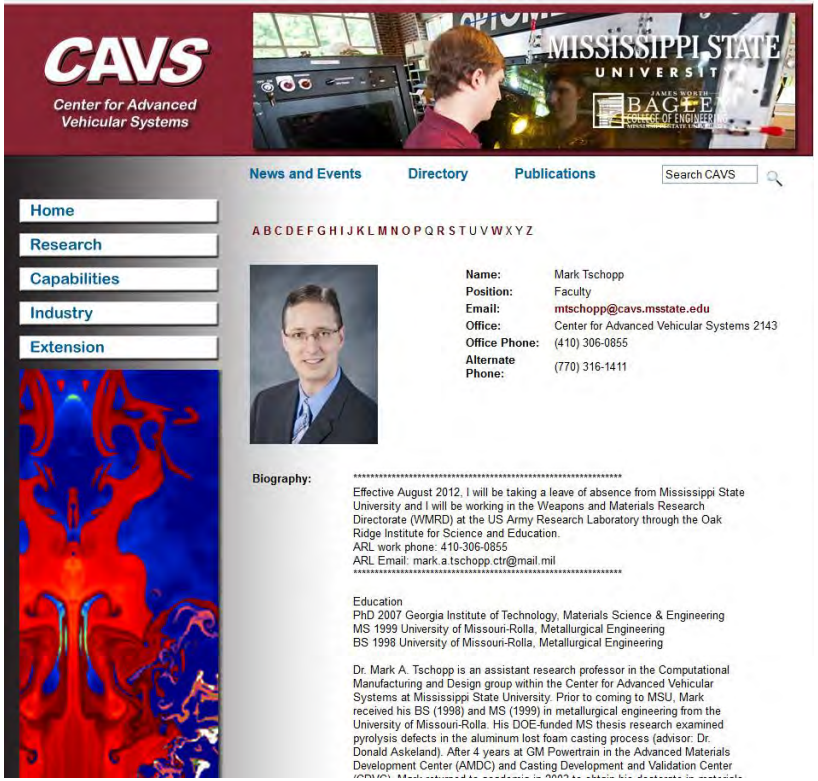


<u>What is the first thing that comes up when you type your name into GOOGLE?</u>

- If you enter your name, what comes up first?
- Is it what you want people to see?
- Are you taking advantage of this? This is a blank slate for you to share your strengths with others…
- What about your signature on emails? Do you have an associated webpage?
- How many clicks to get to your resume/CV? What about publications (Google Scholar)?

Beware of what you enter on twitter and other sites (mailing lists)!!!

Make a good first impression

The casual snapshot

Status:
"Like, whatever, i didn't just spend 3 hours trying to pick my profile picture."

Know your audience!!!

How do you make a good first impression (or not make a bad impression)?

- 1-on-1 meetings in professional or casual settings
- Presentations
  - Conference and otherwise…
- Asking questions
  - is your question/comment better "offline"?
  - is this someone that you can ask basic questions to?
  - is it something that can be found online?
- Get feedback from others. Have someone you can trust to be honest.
- What do you do (for research)?

C.C. Berndt: **"People will only remember you from their last interaction with you."**

Building your network
Increasing Visibility

ASM INTERNATIONAL
The Materials Information Society
Everything Material.

Networking is important!

- Professional societies are great for networking
- Getting involved with committees
- Start locally – expand your network outside of your present work place (you never know when you will need these!)
- The QUALITY of your network is important!!!

Acknowledgments

- **Postdoctoral:**
  - D. Hossain, M. Lugo, A. Moitra, S. Nouranian, E. Asadi, A. Oppedal
- **Graduate students:**
  - CD Barrett (MSU), "Mechanisms of Twin Nucleation in Magnesium", Co-advisor, Fall 2014
  - MA Bhattia (ASU), I Adlaka (ASU), Co-advisor
- **Undergraduates:**
  - NR Rhodes, CD Barrett, CG Rhodes, M Shrivastava, M Patel, S Namdeo, S Kandel, D Zhuk
- **Graduate Advisor** (DL McDowell)
- **GT collaborators** (DE Spearot[Arkansas], GJ Tucker[Sandia], KI Jacob, S Tiwari)
- **AFRL collaborators** (AH Rosenberger, C Woodward, JE Spowart, GB Wilks, BB Bartha[US Space Alliance], MA Groeber, JP Simmons, *et al.*)
- **MSU/CAVS collaborators** (KN Solanki[ASU]. MF Horstemever. DJ Bammann. JL Bouvard, JB .
- **INL/PNNL/LA**
  Millett, M Ton

Who are your mentors?
Who can help you technically?
Who are your peers?
Who are your competitors?
All of these are important!

Materials Genome Initiative (C. Wadia)
"Instead of thinking as individuals, think as a network"

Career Options

I'm done with my degree. Now what?

Internships

Academia

Consulting

Industry

Government Laboratory

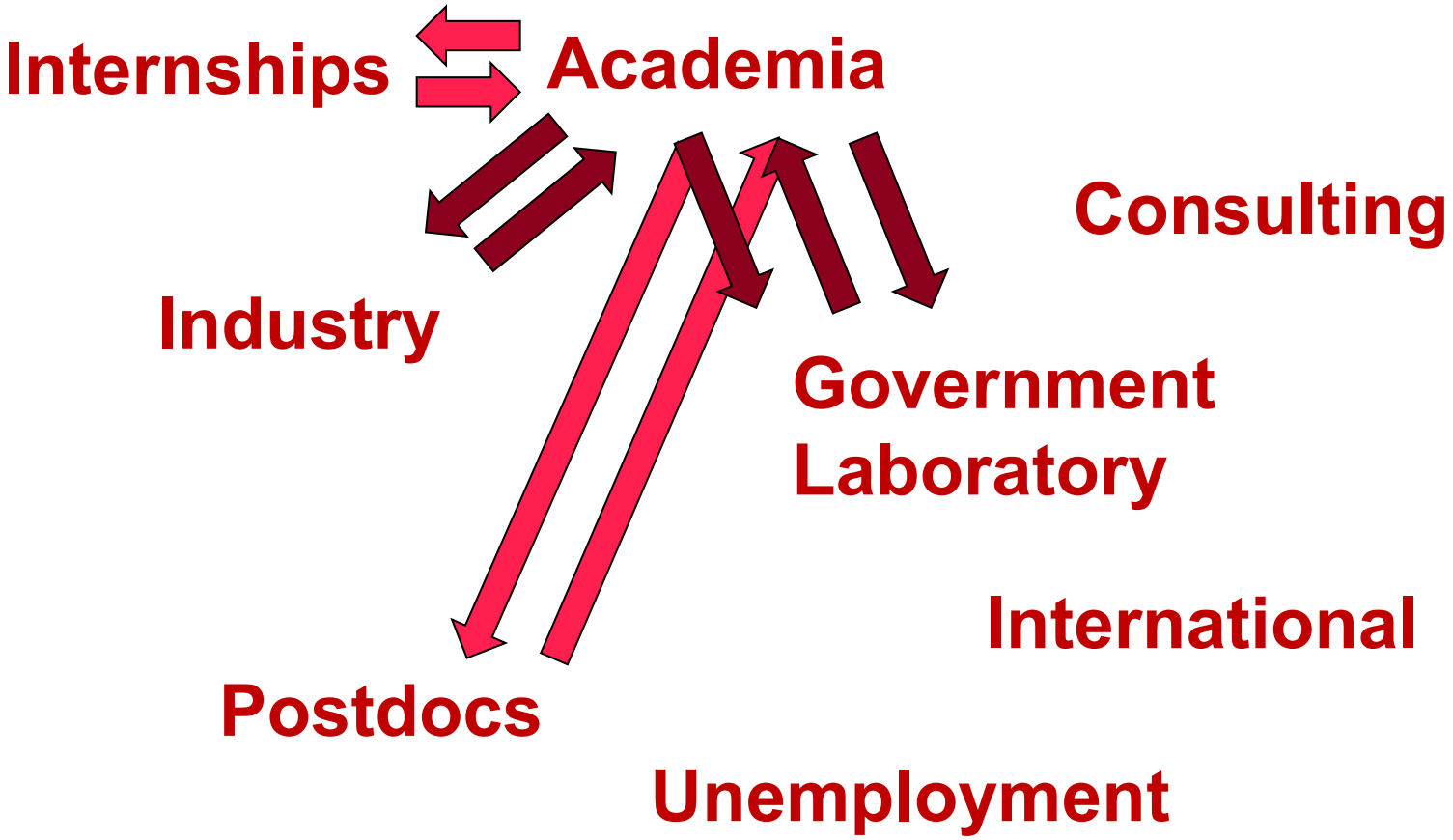
International

Postdocs

Unemployment

Career Options

I'm done with my degree. Now what?



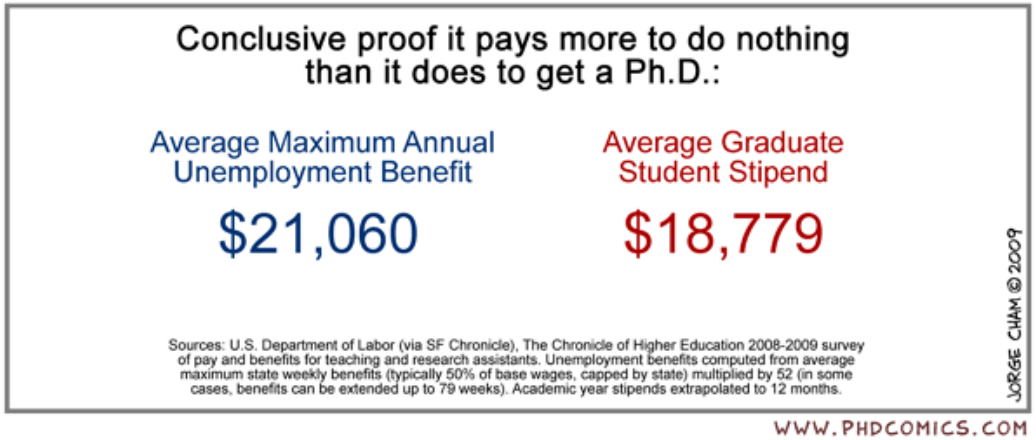
Industry

http://www.stat.gov.mk/
(sadly, one of the top images when you type "industry" in GOOGLE)

Lessons Learned:

1. "Go fast" environment
   - Problem => Loss of Money => Do something!!! (and do it now)
2. Prioritization and goals are driven by $$$
3. Staying technical w/o PhD degree is an option, but sometimes with little/no opportunities for advancement
4. Solutions to technical problems sometimes become repetitious. Many problems turn out to be people problems.
5. Managerial Roles are often only way for advancement
6. Flexibility with location and time off
7. Not as bad as some portray it to be

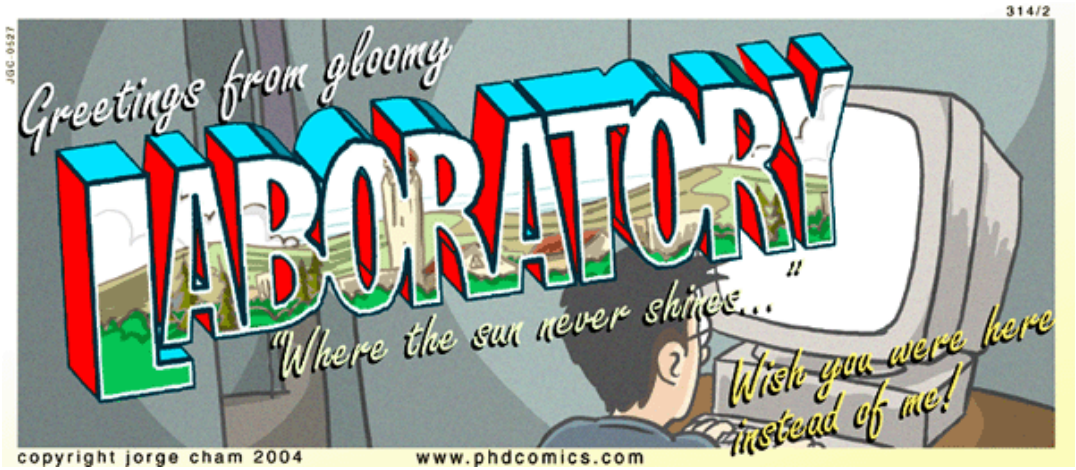
Life of a PhD student



Questions:
What are you passionate about?
Where is the best opportunity based on this?

Lessons Learned:

1. Visit many universities/departments – rankings aren't always what they are cracked up to be…
2. Technically challenging (and rewarding!)… R&D affords the opportunity to always work on something cutting edge or novel
3. Industry helped – Having an 9-5 work mentality is good (unfortunately, the hours are a little longer than that and you often can't stop thinking about research after you go home)
4. Easy to become focused on just research => think ahead about your next career step as well (where will you go? Who do you need to contact?)

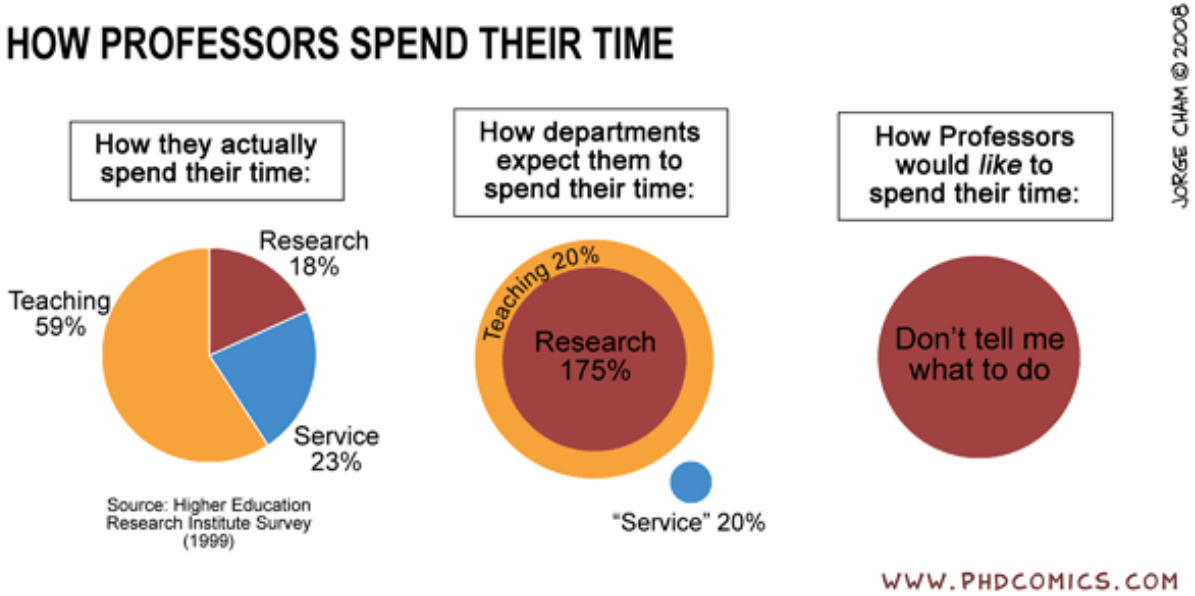


Lessons Learned:

1. More red tape… Don't use this as an excuse to not be productive. Find ways to become efficient and productive! (Hint: Ask for advice)
2. Ability to change research directions is highly desired:
   - Restructuring/reassigning can be common
   - Contractors may need to be flexible in research. Can you handle switching research every few years?
3. Emphasis on metrics (publications/presentations) as well as delivering on projects/contributing to the mission
   - Need to find a way to do both

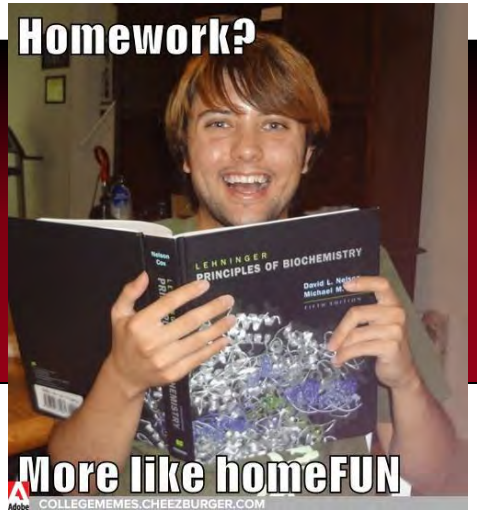
Lessons Learned:

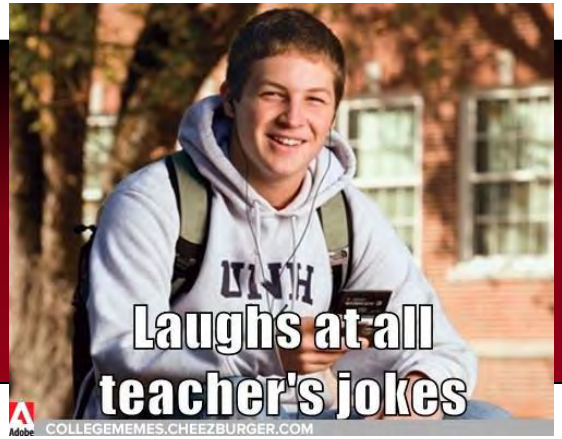
1. **Optimization problem:** How do you maximize the time spent on items that go into your CV?
2. Have to learn to say 'No' (just not too early in your career)
3. Are your research ideas transformative enough? It depends on who is asking. Know your audience…
4. Perception is important (sometimes too important)
5. Publications are important, but aren't everything

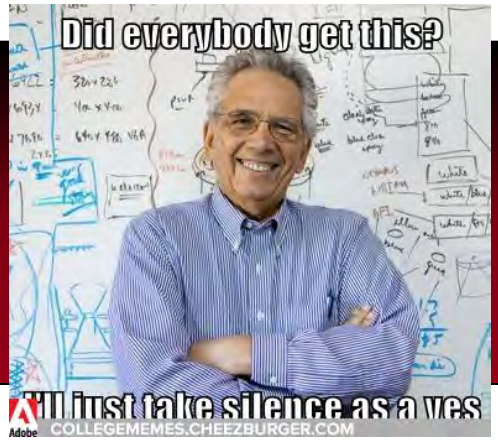


Lessons Learned:

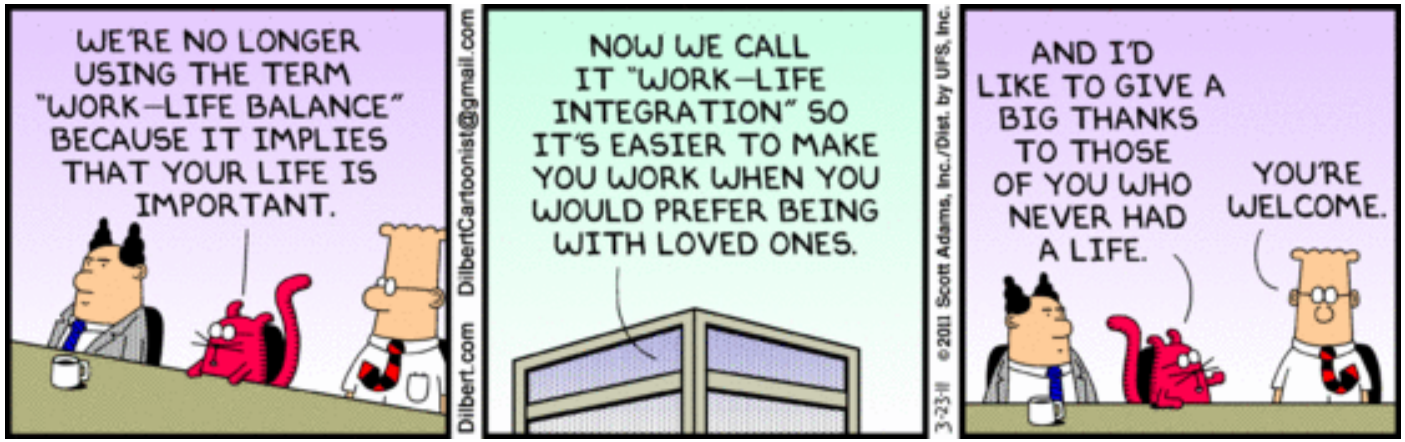
6. Opportunities aren't quite as easy to come by:
   - Right research area, right personality, right fit, right school/advisor, etc.
   - Departments and search committee take on their own persona
   - Want an academic position? Start acting like a tenure-track professor…
7. Be conscious of productivity versus time from PhD (not time in PhD)
8. Don't be in a rush to exit before you are ready to independently conduct research.
9. Collaborate. Find mentors. Ask for advice (some professors are extremely helpful – they gladly tell you what's wrong with you or your application – just listen!)
10. Unfortunately, the best time to move to the next position is probably the worst. Keep applying and don't restrict your opportunities by not applying.







Work-life balance



www.dilbert.com/

- What is the correct balance for you (and/or your significant other)? Dual career family?
- Do you like a small town? City? Metropolis?
- What do you like to do in your free time?
- Do you have regional preferences?
- What about opportunities/activities for kids (or future kids)?

Thank you

Find out what direction you want your career to go in….

Stay the course…

Keep doing the right things…

Be open to opportunities…

Keep your CV up-to-date…

Remember to have a life outside of work…

Good Luck!!!

The End

(no more slides!)