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What's Grad School All About?

Michele C. Weigle
Old Dominion University, mweigle@odu.edu

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What's Grad School All About?

Michele C. Weigle

Associate Professor
Graduate Program Director
Department of Computer Science
Old Dominion University
Norfolk, VA

Capital Region Celebration of Women in Computing (CAPWIC) 2015
February 27, 2015
Outline

• Introduction / My Background

• Grad School

• Academia

• Final Tips
Who Am I?

• Michele Weigle

• Associate Professor of Computer Science
• Old Dominion University in Norfolk, VA
• Graduate Program Director - MS Program

• Research interests: web science, digital preservation, information visualization, wireless networking

• Wife and mom of 2 boys
My Successes

• Students
  – Graduated 4 MS Thesis students
    • 2 are PhD students (one at ODU, one at NC State)
  – Graduated 4 PhD students
    • 2 are assistant profs at universities in Indiana
  – Currently advising 5 PhD students

• Teaching
  – Taught 11 different courses
  – Developed new courses in vehicular networking and information visualization
  – ODU College of Sciences Distinguished Teaching Award – 2013-2014
My Research Successes

• ~75 peer-reviewed publications (conferences and journals)
  – 5 best paper (and best student paper) awards

• 4 book chapters

• 1 edited book

• > $2M in grant funding
  – National Science Foundation, National Endowment for the Humanities, Andrew Mellon Foundation
My Personal Successes
Who Was I?

- Small-town Louisiana gal
- Computer Science undergrad in Louisiana
- Computer Science MS and PhD at UNC-Chapel Hill

1964 - 2014
Welcome to the Northeast Louisiana University home page. Click on the graphic above, or the following links for more information.

Welcome to NLU, academics, enrollment, athletics, campus info, publications, alumni, lagniappe, publishing on NLU's web.

- Greater NLU Annual Fund - Realize the Vision
- 1997 "Best Practices" Institute - The Challenge of Educating Special Children
- An Email Search and the NLU Gopher Server are located under the campus info link.
- Click here for NLU's Web Page Policy

Welcome to Northeast Louisiana University. Email Search Now Available. Email Search can be found at the Campus Info Link.
Undergrad Experience

• Went to relatively small CS dept in my home state, no graduate program
  – allowed me to stand out and get good recommendation letters for grad school

• Advisor (and later department chair) was female
  – helped to hear her experiences and encouragement
Thought about changing majors my first year

• Algorithms was confusing

• Then senior friend told me that he’d asked prof who was best student in Programming II. She mentioned me.

• I. had. no. clue.
What is the Imposter Syndrome?

• Do you have the *imposter syndrome*? From my discussions with friends and colleagues, it's very common among women in computing and technology. (I've heard that there a few men who suffer from this, too!)

• Here's the list:
  – Do you secretly worry that others will find out that you're not as bright/capable as they think you are?
  – Do you attribute your success to being a fluke or "no big deal"?
  – Do you hate making a mistake, being less than fully prepared, or not doing things perfectly?
  – Do you believe that others are smarter and more capable than you are?

[Borrowed from Tracy Camp]
Stats on Women in Academia

CS degrees awarded to women
- 14% of BS degrees
- 21% of MS degrees
- 17% of PhD degrees

Female faculty
- 26% of Assistant Professors
- 19% of Associate Professors
- 13% of Full Professors

Source: 2013 Taulbee survey

Women's participation != women's interest

<table>
<thead>
<tr>
<th></th>
<th>1970s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law school</td>
<td>5%</td>
</tr>
<tr>
<td>Business school</td>
<td>4%</td>
</tr>
<tr>
<td>Medical school</td>
<td>8%</td>
</tr>
<tr>
<td>High school sports</td>
<td>4%</td>
</tr>
</tbody>
</table>

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How did I get there?

- NSF Graduate Research Fellowship
  - support for 3 years of grad school
  - opened lots of doors

- I’d always loved the state of North Carolina

- Fell in love with the department on my visit
  - also visited and applied to Alabama and NC State
  - plus, UNC had the best basketball team
How should you pick a grad school?

• Do your research
  – faculty interests, course offerings (don't just look at the catalog), program requirements
  – for PhD: identify potential advisors, read their papers, send them an email

• Look at program rankings
  – http://www.phds.org/rankings/computer-science
  – but be aware of the dates of the data

• Visit, if possible
  – Scholars Day

• Stakes are higher if you're pursuing PhD vs. MS
  – you'll spend many more years there working on a PhD
My CS Homepage - 1997

Michele Clark

CB# 3175 Sitterson Hall
University of North Carolina
Chapel Hill, NC 27599-3175

A bit about me:

I'm a MS/Ph.D. student in the Department of Computer Science at UNC in Chapel Hill. These are the research groups I'm involved in at UNC:

- DiRT Group (Distributed and Real-Time Systems)
- nanoManipulator Project (NEW this summer!)
- Collaboration Group
- Collaboration Bus Project

I earned my BS in computer science at Northeast Louisiana University in Monroe, LA.

My hometown is St. Francisville, Louisiana, a beautiful small town on the banks of the mighty Mississippi, known for its antebellum plantation homes and centuries-old live oak trees.
CS Student Assoc Pres - 1999

Michele Clark

CB# 3175 Sitterson Hall
University of North Carolina
Chapel Hill, NC 27599-3175

CSSA President
Office: 108 Sitterson Hall
Phone: #1909 (office) or #1937 (DiRT lab)
Spring '99 Schedule

Academics

I'm a Ph.D. student in the Department of Computer Science at UNC in Chapel Hill, NC. I just received my MS in computer science from UNC in May 1998. I earned my BS from the Department of Computer Science at Northeast Louisiana University in Monroe, LA. While there, I was a member of NLU's Honors Program.

Current Courses (Fall 99):
COMP 321 Technical Communication
OR 183 Stochastic Models

Previous Courses at UNC (Fall 96 - Fall 98)
Teaching - 2000

COMP 14-090: Introduction to Programming
Summer I 2000

Monday - Friday  9:45 - 11:15 am  Sitterson 014

Instructor: Michele Clark
Email: clark@cs.unc.edu
Web Page: http://www.cs.unc.edu/~clark
Office: Sitterson 143
Phone: 962-1909
   Monday 1-2pm
   Tuesday 2-3pm
Office Hours: Wednesday 3-4 (in Davis Lab)
   Thursday 1-2pm
   Friday 2-3pm

Lab Assistants: Jay, Sandy, Lily, Ian

Announcements (updated 6/16)
- added - final grades
My Friends

• Fellow female CS students help me get through and boosted my confidence
Grad School

• I loved grad school  
  – and I love it even more now that I can look back fondly on it

• No "real-life" responsibilities  
  – single, no kids, no house

• Developed life-long friendships
• Met people from all over the world
• Worked with really smart people
• Worked on interesting projects
• Got to code!
• Attended interesting (sometimes!) classes
• Got to travel (for free) - Italy, Sweden, Lake Tahoe, Norfolk
MS vs PhD - Jobs

• A masters degree equips you to do high level, complex design and potentially lead software engineering teams.

• A PhD degree equips you to do original research and potentially lead R&D teams.

Vijay Chidambaram, computer science grad student
MS vs. PhD - Requirements

• MS
  – 30 hours of coursework (10 courses)
  – final project, comprehensive exam, or thesis
  – usually 2 years

• PhD
  – 72 credit hours
  – 24 hours of dissertation credits
  – 48 hours of coursework (16 courses)
    • MS courses usually count towards this
  – variable (often 3-4 years after MS)

Numbers here are typical, but may vary by department.
MS vs. PhD

• "a PhD teaches you how to ask the right questions"
  

• Your PhD advisor's job is to ask questions about your work
  – why does the output/graph/result look like this?
  – what would happen if you ran the experiment/analysis another way instead?
MS vs. PhD

Ron Azuma's classic article

“So long, and thanks for the Ph.D.!”
a.k.a.

“Everything I wanted to know about C.S. graduate school at the beginning but didn’t learn until later.”

The 4th guide in the Hitchhiker’s guide trilogy (and if that doesn’t make sense, you obviously have not read Douglas Adams)

by Ronald T. Azuma

v. 1.10

Original version 1997, last revised December 2014

William Lipscomb, a Nobel Prize winner in chemistry, said, “With a Ph.D. you will have a better chance of spending the rest of your life doing what you want to do, instead of what someone else wants you to do.”

http://www.cs.unc.edu/~azuma/hitch4.html
Surviving the PhD

• Read Ron Azuma's guide

• Perseverance
  – it can be slow, it can get boring, some days you just have to get through it

• Initiative
  – your advisor will rarely bug you each day to make sure you're working, must set your own goals

• Curiosity
  – PhD students are usually ready to graduate once they start asking their own questions about their data and research

• Coffee
  – *my PhD students told me to add this one*
What is Research?

Matt Might (http://matt.might.net/), a professor in Computer Science at the University of Utah, created "The Illustrated Guide to a Ph.D." to explain what a Ph.D. is to new and aspiring graduate students.

[Matt has licensed the guide for sharing with special terms under the Creative Commons license.]
http://matt.might.net/articles/phd-school-in-pictures/
Imagine a circle that contains all human knowledge

http://matt.might.net/articles/phd-school-in-pictures/
By the time you finish elementary school, you know a little

http://matt.might.net/articles/phd-school-in-pictures/
By the time you finish high school, you know a bit more

http://matt.might.net/articles/phd-school-in-pictures/
With a bachelor's degree, you gain a specialty

http://matt.might.net/articles/phd-school-in-pictures/
A master's degree deepens that specialty

http://matt.might.net/articles/phd-school-in-pictures/
Reading research papers takes you to the edge of human knowledge

http://matt.might.net/articles/phd-school-in-pictures/
Once you're at the boundary, you focus

http://matt.might.net/articles/phd-school-in-pictures/
You push at the boundary for a few years

http://matt.might.net/articles/phd-school-in-pictures/
Until one day, the boundary gives way

http://matt.might.net/articles/phd-school-in-pictures/
And, that dent you've made is called a Ph.D.

http://matt.might.net/articles/phd-school-in-pictures/
Of course, the world looks different to you now

http://matt.might.net/articles/phd-school-in-pictures/
So, don't forget the bigger picture

Keep pushing.

http://matt.might.net/articles/phd-school-in-pictures/
Skills Gained Through PhD

• Ability to work independently

• Critical thought
  – A PhD candidate learns to critically examine the thoughts of others and pick out the pros and cons.

• Perseverance

• Ability to work with poorly defined goals
  – One of the bigger hurdles of the PhD is that there is no clear cut goal.
  – No one can exactly say these are the things you need to do every day.
  – Research as such involves going back and forth, exploring blind alleys and so forth.

• Effective communication

Vijay Chidambaram, computer science grad student
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Why did I want to become a professor?

- Inspired by mentors and undergraduate/graduate faculty

- Liked teaching
  - really enjoy learning something new, organizing the information, and figuring out the best way to present it

- Flexibility
  - can choose own research topics (to some extent)
  - my advisor coached his son's soccer team

- I loved being a graduate student, didn't want to leave academia
Clemson

- Assistant Professor - 2004-2006

- Students investigated high-speed TCP protocols and Internet traffic generation for simulations
  - 2 MS thesis

- Started investigation of vehicular networks
  - using PocketPC and Bluetooth GPS devices

- Teaching networking courses
  - ugrad - network programming
  - grad - network protocols
• 2006 - Joined as assistant professor
• 2012 - Tenure, associate professor
• 2013 – Graduate Program Director

• Vehicular networks, sensor networks, web science, digital preservation, information visualization
Vehicular Networks - NOTICE Project

An Architecture for the Notification of Traffic Incidents and Congestion (NOTICE), National Science Foundation, 2007-2001, $400,000
Web Science and Digital Libraries

WARCreate

Information Visualization
Perks of Academia

- Work with really smart people
  - faculty colleagues
  - students

- Always learning new stuff
  - teaching courses
  - research

- Control your own destiny
  - no one's looking over your shoulder to see if you're in your office 9am-5pm
  - change research projects and focus
What You Don't Learn in Grad School

• Programming is fun
  – and depending on what you end up doing, you may not get to do it much again!

• Managing people
  – how to get the best work out of your students (both in class and in research)

• Much of what you'll do is reading, editing, writing, and talking
  – reading and editing students' papers
  – writing proposals
  – meeting with students, giving talks
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Time Management

• Work-life balance
  – or as Tracy Camp calls it “work-life integration”

• Still working on figuring it out

• Generally hate to be idle, always something on my to do list I feel like I should be doing

• Helps to have an equal partner
  – my husband has a PhD, too
  – and he cooks, grocery shops, shares parenting responsibilities
Importance of Mentors

• Undergraduate
  – My advisor and dept chair – Dr. Krissten Cooper

• Graduate
  – My advisor – Dr. Kevin Jeffay, UNC
  – Fellow grad students

• Professional
  – Dr. Tracy Camp, Colorado School of Mines
  – Dr. Gail Dodge, physics at ODU
  – Dr. Michael L. Nelson, colleague at ODU
Networking at Conferences

• At meals, sit with people you don’t know

• Introduce yourself

• Ask questions about others

• If you’re sitting with a group from your school, be polite and open to newcomers
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@weiglemc  http://www.cs.odu.edu/~mweigle/