

CS 891  
Introduction to  
Emerging Technologies  
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Lecture 2: What's a PhD and why do I want one?

# Lecture Topics

- What is a PhD and why do you want one?
- A day in the life of a PhD...
- This is a doctoral level course...
- So you ~~want~~ need to publish

**Material in this lecture heavily influence  
(and sometimes borrowed from) WS-DL researchers:**

<https://phonedude.github.io/cs891-f17/>

<https://www.cs.odu.edu/~mweigle/Resources/ResearchMethods>

# What is a PhD?

- A job in academia that trains you to be a researcher
  - Original research
  - Leading R&D
- Focus is on research
- Often ill-defined success criteria
- Relies on verbal and non-verbal communication
- Self-motivated, self-paced work, collaborative and community-focused outcomes
- **Becoming the world's foremost expert on [*insert dissertation topic here*]**

# What does it take to earn a PhD?

- 110% of your attention
- Endurance
- Communication skills
- Flexibility
- Endurance
- Creativity
- Endurance

# Remember your Bachelor's?

- You are given a course schedule
  - (OK, you picked a few electives...)
- Instructors pose questions, you give answers, you're told if you're right or wrong
- You showed up and did what you were told for ~4 years and got a degree in return
- You are certified to be competent in your topic area (e.g., CS)

# And you may have/are working on a Master's

- Increased depth and/or specialization
  - You have a few core courses
  - You probably selected about half of your courses
- This is your introduction to research
  - You are asked a question and you need to determine the answer *and* whether or not you are correct
  - Answers become less definite!
- You are certified to understand the complexities of your field, potentially with a specialization

# What does a PhD look like?

- No emphasis on courses (you only take a few)
- No one has the questions OR the answers!
  - You embark on original research
  - You define the questions, the answers, and have to prove that you are correct
  - Wide-open, not concrete
- “You know more and more about less and less”
  - You are highly specialized
- You will work extremely closely with your advisor (so make sure you work well together!)

# What else does a PhD look like?

- “A PhD teaches you how to ask the right questions”
- Researching, conferences, publishing, collaboration
  - All comes from outside the classroom!!!
- Ability to communicate questions, answers, results, and methodologies
- Run experiments and interpret results
- Critique research
- Determine what questions to ask and how to help others find the answers

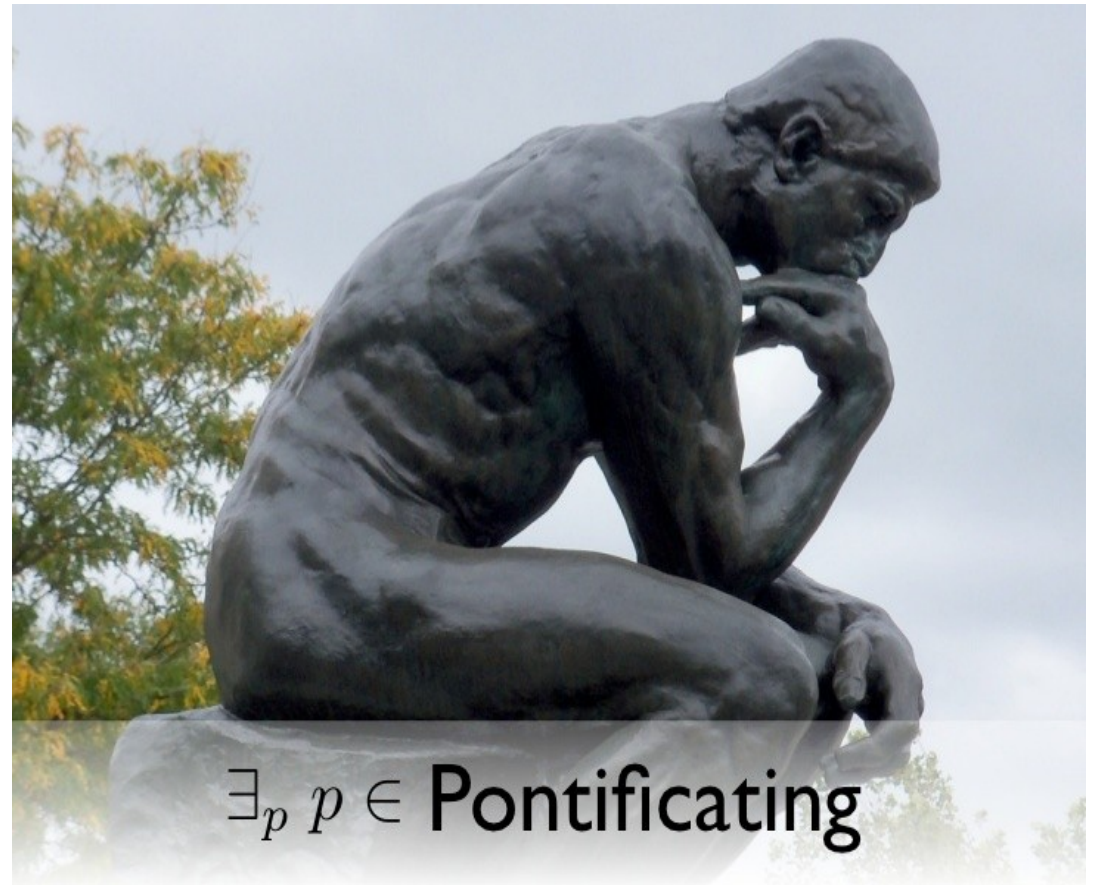


# Anything else?

- Sleep deprived
- Over-caffeinated
- Super exciting

# A Day (...or so) In The Life

- Proposal writing
- Publishing
- Presenting
- Mentoring
- Leading
- Experimenting
- Writing
- Speaking



# Aspects of working as (and getting) a PhD

- Not about the hours (this isn't a 9-5)
- Focus is on results
- Keep a log of your work
  - Stay organized
  - Recall what you did and how you did it
  - Advertise and self-promote

# What PhDs Need

- Publications
- Citations
- Funding

# Conferences

- Conferences vs. Journals – in CS
  - Multidisciplinary positions and the impact on your CV
- Tiers of conferences:
  - Top tier: <15% acceptance
  - Mid-tier: 15-25% acceptance
  - Other decent conferences: ~30% acceptance
- Varies by discipline
- See: WWW, SIGIR

# Conferences

- In CS:
  - Quantifiable results
  - Published methodologies
  - Cited as recent works or examples
  - Often highly regarded
- In Non-CS (e.g., humanities):
  - For demonstrating intermediate results
  - Often thought pieces or lit reviews
  - Often regarded as stepping stones to journals
- In both:
  - Intended for recent/evolving research
  - Cited less frequently than journals

# Conference review process

- 1) Work really hard on discovering something
- 2) Write down what you did and discovered in a paper (also really hard!)
- 3) Submit it to a conference
- 4) Paper is read by ~3 people
- 5) They provide a detailed review on the paper's merit and recommend accept/reject
- 6) If accepted – present it! If rejected – revise and try again later!

# Journals

- In CS:
  - Domain affecting research and results
  - Often long-lasting results
  - Exemplary of multi-year efforts (e.g., a PhD)
- In Non-CS (e.g., humanities):
  - Standard publication expectation
  - Exemplify a quantifiable result
- In both:
  - Often high-impact
  - And as a result, often highly cited



# Journal review process

- 1) Work really hard on discovering something
- 2) Write down what you did and discovered in a paper (also really hard!)
- 3) Submit it to a journal
- 4) Multiple (3-6) reviewers are assigned
- 5) All make recommendations for accept/reject/accept with minor modifications/accept with major modifications
- 6) Senior reviewer makes official recommendation
- 7) If accepted, it's published! If you need to make modifications, it may mean making significant changes or additional research. If rejected, you need to choose a new venue.

# Good reading material

- <http://matt.might.net/articles/phd-school-in-pictures/>
- <https://ronaldazuma.com/hitch4.html>
- <http://matt-welsh.blogspot.com/2012/03/do-you-need-phd.html>
- <http://matt-welsh.blogspot.com/2010/09/so-you-want-to-go-to-grad-school.html>