

PhD Rants and Raves


(Be afraid. Be *very* afraid.)

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What is a PhD?

- An advanced graduate degree awarded for demonstrable ability to do research
 - *research* = the production of new knowledge

Why Do a PhD?

- A lot of bad reasons
 - financially, it may not make sense
 - some people do it just because being a student is fun
- Only one good reason: be a Jedi knight! 

Luke! You must complete the training...


Only a fully trained Jedi Knight with the force as his ally will conquer Vader and his Emperor.

if you are fascinated by CS and want to go deep, then a PhD is the right thing for you

A Jedi must have the deepest commitment, the most serious mind. 

PhD years: the time of disillusionment

Luke: I am ready. Ben! I can be a Jedi. Ben, tell him I'm ready.

*(Trying to see Ben, Luke starts to get up but hits his head on
the low ceiling.)* 

At first...

- New students typically think they know everything

Luke: But I've learned so much

Yoda: (sighs) Will he finish what he begins?



- I have yet to see anyone with just a bachelor's who is able to make a contribution right away
 - and I've had students with many years of industrial experience

Time of Disillusionment

- I have bad news for you. During your PhD you will find out: (page 1 of 56)
 - there are people who are better than you
 - you are not good at everything. Play to your strengths!
 - life is unfair
 - people who are not as smart or hard-working will be luckier and end up with better results
 - people who have done worse work will end up with better jobs because of their field/advisor

Time of Disillusionment

- More bad news:
 - being good at courses is not enough
 - doing what you are told may not be enough

PhD years: the time of insecurity

Luke: I won't fail you—I'm not afraid.

Yoda: Oh, you will be. You will be. 

Insecurity

- You may often wonder:
 - am I good enough?
 - are you here for the right reason?
 - can I do research?
 - yes, you can
 - why do all the people around me publish and I don't?
 - concentrate on what you do and do not try to evaluate yourselves with post-PhD criteria

When Will I Finish?

- Here are some good news: time stops during your PhD
 - nobody will ask you why you took n years and not $n-k$ to finish
 - you have a good excuse to hide from society and do your thing. You are fully justified!
 - good thing too, because the timeline is very uncertain

Keep Concerns Away

- To do this, you must ignore some real-world concerns
- Easier said than done:
 - stipend is enough to live on, but does not compare to a salary
 - perhaps ok if you are 23, but even then, for how long?
 - friends will start careers, buy cars and houses
 - you will be spending the best part of a decade in a time warp

You Control Your Fate

Luke: What's in there?

Yoda: Only what you take with you...

Your weapons...you will not need them.



Some Good News

- You have (some) control of your destiny
- If you do great work, you will be noticed
 - no pre-set boundaries: your peer group is the entire community, not people in the same university
- *Your* work determines your fate
 - Georgia Tech's reputation, your advisor's work, your field, etc. are all secondary (although they do matter!)

Advice

- Strive to improve yourself!
 - if time is not an object, this will eventually pay off
- You are in the ideal position to make significant contributions
 - professors are not!

“Survivor Story” Warning

- Of course, this is survivor advice
- Don't ask survivors for advice
 - “Russian roulette is a great way to make money!”
- Take what I say with a grain of salt, but take everything *anyone* says with a grain of salt
 - doubt everyone, and start with me

More Good News

The Force is strong

PhD Life is Fun

- If you are here for the right reason, a PhD can be tremendous fun
- You are a student, but can support yourself
- You will work on interesting things
 - a lot of freedom, few obligations
 - think of yourself as a freelancer
- “The only time in your life you will be paid to learn.”

How to Pick an Area

Luke: Is the dark side stronger?



Yoda: No...no...no. Quicker, easier, more seductive

Research in the CoC

- Different kinds of research
 - *scientific research* = research based on *analysis*
 - analyze until you find the most fundamental parts, even if working with them does not resemble working on the original problem
 - *engineering research* = research based on *synthesis*
 - compose many small solutions into a single big one

Predicting the Future

- Future employability should not be your primary criterion
 - it is impossible to predict the future very accurately
 - in the 80s AI was hot; in the early 90s it was multimedia; now it is security and biocomputing
 - many students find that the area that was hot when they started is saturated when they graduate

Importance in the Real World

- Many people use the potential impact in the real world as their criterion
 - but big real-world problems are big because they are hard
 - if you want to work on something important and make no difference, be a politician

Concentrate on Mode of Research

- Many research areas are defined by problem and not by solution approach
 - E.g., networking, SE
- Make sure you like the mode of research in an area
 - is it theoretical or applied?
 - what flavor do the intellectual results have? Does this inspire you?
 - what do you have to do every day? Code? Think?

Don't Trust Big Results

- I like the big results in every area of CS
- We will all be happy if one of you gets one such result in his/her lifetime
- To pick an area: be sure you like the incremental results
 - you should consider them important, or at least fun!
 - or you can just talk yourself into believing that incremental results are big

Fall in love with your cows!