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 may be noticed
  - no pre-set boundaries: your peer group is the entire community, not people in the same university

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 CS

- 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!