Another Biased Coin*

Jianping Pan
UVic Computer Science
October 31, 2011

* inspired by Michael Mitzenmacher and his blog at http://mybiasedcoin.blogspot.com/

Just in case you haven't googled yet

- Jianping Pan
  - UVic Faculty Member
  - Industry Research Labs MRS and Scientist
  - UWaterloo Postdoc and Research Associate
  - Bachelor's and PhD degrees from Southeast Univ
- Research area
  - Computer Networks and Distributed Systems
    - protocol design, performance evaluation, network security
- more at http://web.uvic.ca/~pan

Why do you want to do grad study?

- The question I asked myself ~20 years ago
  - and I am still looking for the “right” answer
- The socioeconomic demands, in terms of
  - numbers: Bachelor's >> Master's >> PhD
  - expectation: Bachelor's << Master's << PhD
- A Master's or PhD degree
  - does not mean better life/work/money (often do tho)
  - does mean you have to contribute more to others
    - the intellect, economy, society and humanity!

Whatever you want, you are in now

- How do you get the best out of it?
  - Master's 1.5~2 years and PhD 3~4 years@UVic
  - might be much longer (in other places)
  - nevertheless, they are considerable amount of time
- Graduate study is NOT your career destination
  - come early and go early
    - industry experience is also very valuable!
  - finish smoothly and successfully
  - key: step into your career goals and destination

In terms of career goals

- You are what you want to be
  - people normally do not go higher than they target
- Look beyond the *Island*
  - you are less likely to compete with the one who is sitting next to you now on the job market
  - you are more likely to compete with the ones
    - in other universities in NA and around the world
- Find the place(s) you want to go
  - look at the resumes of their recent new hires
  - set your goals, targets and schedule appropriately

If you are not bored yet

- I have some observation from my experience
  - what I have learned myself
  - what other people have told me
  - what I have learned from other people

  - WARNING: they are possibly highly biased and only specific to certain research areas
  - yet Another Biased Coin (ABC), so do take with a grain of salt/thought ;-)

If just to learn/master one thing...

- Time management
  - graduate study is so different from undergrad
    - undergrad: study books, go to classes, take notes, do assignments, etc, and likely you will do well in exams
  - in graduate study, you do have a guide
    - your supervisor, advisor, mentors, senior students, etc
  - but eventually you have to be on your own
    - graduate as an independent engineer/researcher
  - and very soon you will find out that
    - you suddenly have a lot of time to manage yourself!
  - there are some good skills to use and master

If two things...

- Time management
- Research skills
  - research approaches, methodologies
    - how to identify and formulate problems
  - common research tools and resources
    - how to solve problems and evaluate solutions
  - they are more important than specific “topics”
    - you are likely to work on different topics after graduate
    - people sometimes even have to move to another area
    - of course, better if you have a topic of your most interest

If three things...

- Time management
- Research skills
- Keep motivated
  - research is not an easy job
    - otherwise, it is not called (re)search
  - mistakes and failures are not totally avoidable
    - don't be discouraged---it's a learning process
    - learn from (your own) experience is very important!
  - there IS a lot of help around you
    - but you also have to learn how to help yourself

Of course other things are important

- Most likely you should have them already
  - academic integrity---lifeline of a professional/univ
    - “things you took for granted” may not be right
  - professional ethics and courtesy
    - you are in a community: reputation, credibility, etc
  - professional behaviors and conducts
    - “wrong is not the right answer to wrong”
  - learn from your peers and mentors
    - do better than them and have a positive impact on others
  - and many many more...

Research in my lab

- Networking becomes a foundation in EE/CS
  - distributed algorithm design, social online nets, etc
  - challenging but also rewarding: very competitive
    - the power of network connectivity might be n^2
    - the power of (a) network research might be n^{-2}
- Some recent research projects
  - IPTV in-home distribution and service provisioning
  - P2P live and on-demand video streaming
  - wireless/mobile sensor/social networks
  - vehicular ad hoc networks, etc

Example: IPTV and P2P

- Key 1: how to find the problem
  - networking research is practical enough
  - e.g., rewiring cost is too high for home networks
    - multi-link wired and multi-hop wireless backbone
  - e.g., longer download time for BitTorrent behind NAT
    - characterize the behavior and make improvement
  - e.g., hi-def P2P video channels are of lower quality
    - better cache and bandwidth allocation strategies
  - measurement, experimentation, prototyping
    - and modeling, analysis, simulation, etc

Another example: topology control

- Key 2: how to solve problems to meet the need
  - networking research also has a deep impact
  - e.g., distances determine many performance metrics in wireless communication systems
  - results on squares and disks are known
  - but cellular systems use hexagons
    - no such analytical tools there---have to build one!
  - random distances associated with rhombuses (sectorized cells with directional antennas) and hexagons (cellular and many natural systems)

What did we hear from the graduates?

- UVic was a great place for my grad study...
  - take advantage of our great profs-students ratio
  - people here are friendly and we can improve together
- Grad courses were limited and too easy...
  - also look at the courses offered in EE/Math/Stat/etc
  - go beyond lectures (which mostly for undergrads)
- We were on an island...
  - go to as many seminars as you can
  - try to attend some conferences in your area

To conclude

- Graduate study
  - is probably the best period of your (professional) life
  - get the best out of it, so you won't regret in future
- Don't underestimate your potentials
  - set the appropriate goals for yourself
  - most tech advances happened/initiated at grad stage
- Together
  - we can have an open, fair and uplifting environment
  - and have a positive impact on others

Hope it helps. Thanks!

- Any questions?
  - I'd like to hear from you as well

pan@uvic.ca

http://koolmornings.files.wordpress.com/2009/09/uvic-rabbit.jpg