

WCRE 2007 Doctoral Symposium

Some Points of Advice
for those who pursue graduate
studies (and more) in software

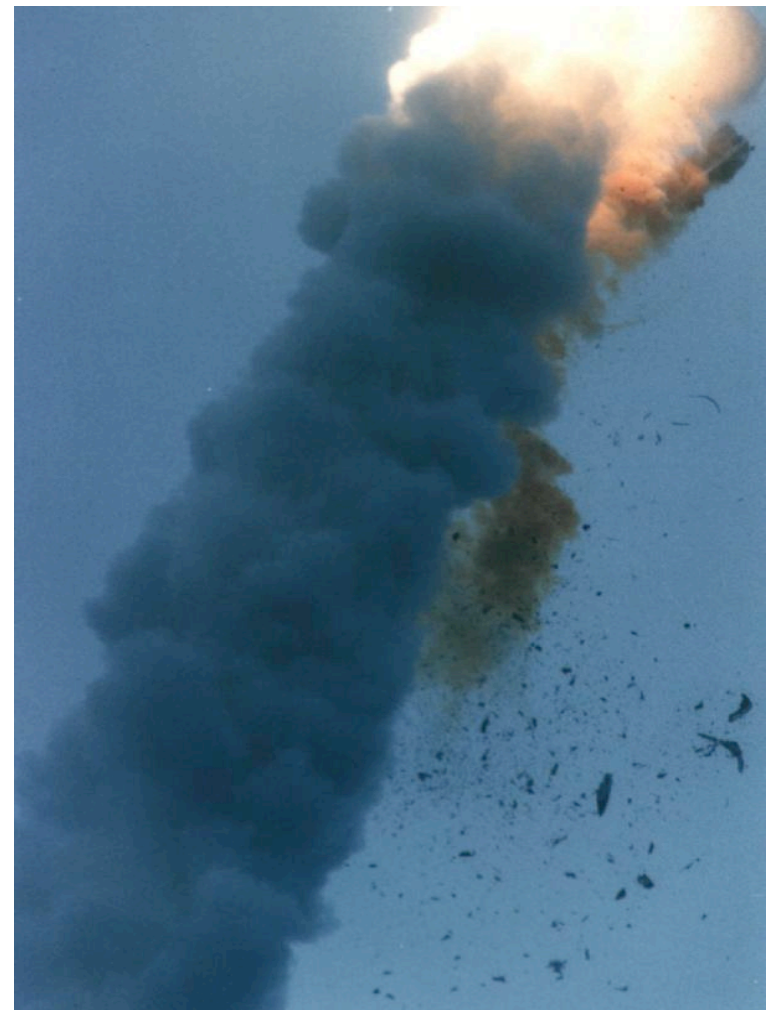
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Starting a career ...



What does it take...

...

- to do a PhD,
- to get a job,
- to get tenure and promotion?

It takes a few things

- Choose a good problem
- Do demonstrably good work towards addressing the problem
- Publish the work in good venues
- Develop a community of collaborators
- Be open to change

And a good bit of LUCK does not hurt either!

How to Choose a Problem

- Well established vs. Hot
 - Slicing vs. Service Oriented Architectures
- Theoretical vs. Practical
 - Model-driven testing vs. Software Asset Recommendation
- In any case, it should be
 - not too easy and not too hard
 - of interest to (at least) one community
 - in an area for which you have (or are willing to put the time to learn) the background

How to choose a thesis supervisor (or more generally collaborators)

- Senior or junior?
 - It makes a difference wrt fame, money, and time
- In any case, you need to be able to
 - respect and trust them
 - work with them
- *It does not hurt if you like them also*

It's all about “area” and “chemistry”

How to Do Research

- Read papers
- Keep a record of your work
 - to know where (and how fast) time goes
 - to remember the dead ends that you have been through
- Have regular meetings with your supervisor
 - to manage his/her expectations
 - to put pressure on him/her
- Establish a close group of colleagues
 - who can act as comiserators, cheer leaders, proof readers
- Find a role model
 - to keep being inspired
- Find a mentor outside from your immediate group
 - A senior researcher in the community
 - A member of your particular background (especially important for women)

The “elevator” test

- Are you able to explain **what is your goal** and **why it is important** in less than 5 min to a non expert?
- What is « **the thesis of your thesis** »?

How to evaluate your research

- Internally
 - Algorithm performance
- Against a realistic system case study
 - Algorithm precision and recall in an open-source project
- Against a test bed
 - The “PRedictOr Models In Software Engineering” data sets
- Against an existing straw-man
 - Fact extractors against grep
- Empirically with real developers working on real projects
 - The “Hippikat” approach

How to Publish

- Write good papers
 - On a **recognizable, interesting and substantial** problem
 - With a good solution that somehow improves on “the state of the art”
- Choose a good mix of venues, including
 - Regular events
 - High-impact venues
 - Venues in each of your potential communities

Decide wisely on the venue mix

- Conference papers
 - takes 6/8 months
 - acceptance rate from 10 % to 40%
 - good conferences and workshops represent good value for money
- Journal papers
 - 6 months up ...
 - not only novelty it must be 30% and plus different from conferences
 - for good papers acceptance rate can be as high as 30%-35%
- Book chapters
 - you need to be invited and it is not clear how much they count

How to Write a Thesis

- By example
 - Look at good and bad examples
- Think about the overall structure of the document and the internal structure of the chapters
 - Make sure that the structure is explicit
- Writing is tough, be prepared for it
 - Make yourself write regularly
 - Do other things in parallel

How to get a Job

- Make yourself known
 - Participate to conferences, meet people, keep in touch with them regularly
- Decide what kind of job you want
 - Academic, industrial, research only, teaching only
- Decide what other jobs you will consider
- Tell people you are looking for a job (not too much) ahead of time
 - Put your upcoming application in the grapevine

How to Have a Life

- Decide (on a regular basis) what your current priorities are
- Recognize your tolerances
 - How unhappy and for how long can you be?
- Make a point to socialize with your people regularly

Managing Change

- Change is part of the process
- When it happens (*you fall out with your advisor, the topic is not working any more, the method or implementation has to change*)
 - Do not lament the wasted effort
 - Do not throw good effort after the bad
- Manage it by
 - Reusing as much as possible
 - Reviewing your goals and expected timelines

11/1/07



It is not the strongest of the species that survives, nor the most intelligent, but the one that is most responsive to change ¹⁸

Others who know

- How to Succeed in Graduate School, Marie desJardins, Dept. of CS & EE, University of Maryland, Baltimore County <http://www.cs.umbc.edu/%7Emariedj/papers/advice-summary.html>
- How to Write Research Papers, Tao Xie, Department of Computer Science North Carolina State University <http://people.engr.ncsu.edu/txie/publications/writepapers.pdf>
- How to do a PhD Thesis, Jim Gray, Microsoft, <http://research.microsoft.com/~gray/talks/How%20to%20do%20a%20PhD%20thesis.pdf>
- How Theses Get Written: Some Cool Tips, Steve Easterbrook, University of Toronto <http://www.cs.toronto.edu/~sme/presentations/thesiswriting.pdf>
- Tomorrow's Professor, Richard M. Reis, IEEE Press.
- How to Get a Paper Accepted at OOPSLA. Kent Beck. <http://www.lore.ua.ac.be/Teaching/Thesis2LIC/BeckAbstract.html>
- How to Read a Paper. Keshav, Waterloo. <http://nsl.cs.surrey.sfu.ca/resources/keshav07.pdf>
- The Task of the Referee. Smith, Berkeley. http://www.computer.org/portal/cms_docs_transactions/transactions/tpami/freecontent/taskoftheferee.pdf
- Robert K. Yin on “Case Study Research: Design and Methods”