Research Methods in CSAI

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Core Reading

Advised Course Book:

Estelle M. Phillips and D. S. Pugh.
How to Get a PhD: A Handbook for Students and Their Supervisors.
Open University Press, 3rd edition, 2000.

PhD Comics:

Available at: http://www.phdcomics.com/comics.php

My Background

- BA Philosophy
- MSc Intelligent Systems
- Research Assistant in Algorithms and Adaptive Systems at the University of Hertfordshire
- PGCert Narrative Research UEL
- DPhil Student Sussex – Ideas Lab

Main Interests

- Software Development
  - Agile Software Development Practices
- Programmer Communication
- Storytelling and Narrative
- Social Spaces

Research

- Research process, MRes, PhD's, DPhils
  - different processes - natural, social, computer sciences
  - completion rates, duration, funding
- DPhil - research degree
  - purpose - research training
  - implication - usually career in research/academia

Research

- Post-it Note Exercise
  - What is Research?
- Discussion

Research process

- Different models
  - Natural sciences eg chemistry - topic assigned to students (sometimes)
  - Social sciences - students originate and research new ideas
- Completion rates
  - Funding bodies expect 3 years FT, 6 PT
  - Sussex - min reg period MSc 1 FT, 2 PT, DPhil 2, 3
  - Department average completion times monitored
- Research Regulations

Researcher's Bible

- *"Read the literature. Have projects similar to yours been tackled before, and were previous attempts successful or unsuccessful? What existing techniques can you borrow or adapt to your project? Do you need to adapt your project proposal to make it novel or feasible?*
- *Talk to people. Do not go away and hide. Do not be ashamed of your ideas. Other people's are sillier.*
- *Tackle a simplified version of your problem. Ask your supervisor for exercises, mini-projects, etc.*
- *Write down your ideas in a working paper. Imagine yourself explaining your ideas to someone. You will be amazed at how half-baked ideas take shape and errors are exposed or solved.*
- *Give a talk to a small group. This has a similar effect to writing down your ideas."*

Supervisors and supervision

- Various kinds of relationship
- Personalities, expectations differ
- Communication
- Guides and protocols (ResBible, Sussex)
- See also ‘How to be my Student’

Supervisors

- Assist with realism and scope of proposed work
- Guide re: nature of res., standard expected, planning, literature sources, advise re taught classes
- Maintain contact (varies with stage of research)
- Be accessible
- Health & safety advice where applicable
- Thesis committee (usually 2 people), annual review

Supervisors…more

- Should be constructively critical
- Have good knowledge of research area
- Be open friendly and supportive
  - (see 'How to get a PhD' by Philips and Hugh OU Press)
- Be courteous (no phone calls in supervision)
- Alert student to new information in area

Supervisors cont'd

- Advise re completion at different stages of work
- Request written work, give feedback
- Arrange for students to present work
- Advise re Univ. codes of conduct eg ethics
- Teach craft of research, assist enculturation
- Arrange examiners for viva (DPhil)
- Help with job later!

Research Student

- Give feedback to supervisor re: usefulness of guidance, help, arrange meetings schedule
- Take initiative in raising problems
- Maintain progress as arranged
- ‘work conscientiously & independently..’
- Publish during…(good for thesis and viva)
- Decide when to submit (joint with supervisor)

Student & Supervisor together

- Point each other to new developments
  - Fields differ in terms of activity and rate of change
- Collaborate on papers for conferences, journals
- Part of social group - laboratory - research grant funded projects - investigators, RA's, RF's
- DPhil might be RA on supervisors research project as well as DPhil student
  - Advantages and disadvantages!

Supervision

- Various relationships
- Differing priorities, expectations
- Communication
- Guides and protocols
- Managing research project, writing thesis
- Ownership of ideas, papers…
- Research committee

Reading:

- ‘How to do Research’ chapter, in *How to Get a PhD* by Estelle M. Phillips and Derek S. Pugh, Open University Press, 2000.
- ‘Advice to a Young Astronomer’ by Ed Nather. Available at http://whitedwarf.org/education/advice/index.html.
- Denning, P.J. (2005) Is computer science a science? *Communications of the ACM*, **48(4)**, 27--31. Available at: http://cs.gmu.edu/cne/pjd/PUBS/CACMcols/cacmApr05.pdf

Further Reading

- ‘Learning as a Research Student’ in *The Postgraduate Research Handbook* by Gina Wisker, Palgrave: Basingstoke, 2001.
- ‘Research and the Research Problem’ in *Your Research Project* by Nicholas Walliman, Sage: London, 2001.
- Parlante, N. (2005) What is computer science? *Inroads - the SIGCSE Bulletin*,**37(2)**, 24--25.
- Dunbar, K. (1995) How scientists really reason: Scientific reasoning in real-world laboratories. In K. Dunbar (Ed.), *The nature of insight*, MIT Press.