

PhD Workshop

UCLU

Peter J Bentley

<http://www.cs.ucl.ac.uk/staff/p.bentley/>

- Why do you want to do a doctorate?
- No, really. Why?
- You need to be very clear in your mind what the reasons are. Thankfully, there are some very *good* reasons why a normal, sane person would choose to do a doctorate.

- **Good reason #1: Wish to achieve something significant**
 - *you wish to challenge yourself, push yourself to new heights or achieve a difficult goal*
- **Good reason #2: Wish to discover or learn something new**
 - *you feel a driving force pushing you to explore and learn new things*
- **Good reason #3: Want to improve yourself and your life**
 - *you want to improve your abilities to understand and solve problems, increase your confidence, make yourself a better communicator and gain skills*
- **Good reason #4: It fits you**
 - *You might have grown up doing countless little “research projects” as hobbies. You might have a natural thirst for knowledge or an insatiable appetite for reading books about a particular topic. You might have had a life-long fascination – even obsession – about something significant.*

- **Bad reason #1: Keeping your visa.**
 - *A PhD is not a good method to stay close to your friends or family.*
- **Bad reason #2: Peer pressure.**
 - *Ignore what your friends are doing - you're the one who has to do the work.*
- **Bad reason #3: Horrible job / can't get a job.**
 - *A PhD is not an escape hatch through which you fall into a better world, it's a long steep staircase that takes extreme perseverance to climb.*
- **Bad reason #4: Fulfilling the ambitions of others.**
 - *It must be your own ambition that drives you, not the ambition of anyone else. Otherwise you'll resent them during the tough times of your work and blame them if it goes wrong.*

- **Bad reason #5: Rebelling.**
 - *If everyone is telling you to go and get a job and you don't like being told what to do, then make sure you're rebelling towards something you want, and not simply away from irritating parents or a boring town.*
- **Bad reason #6: Misplaced genius complex.**
 - *If you think you are brilliant and will solve all of the world's problems, but nobody else agrees – it's quite likely that they are right and you are wrong.*
- **Bad reason #7: Insecurity.**
 - *Maybe you feel that your talents are never appreciated. Just remember that you will receive respect when you earn it, not because of a "Dr" title.*
- **Bad reason #8: You've done this kind of thing before**
 - *Real research experience is great. BUT an undergraduate or MSc project doesn't give a proper taste of a PhD any more than a beansprout makes a Chinese meal.*

- *Count how many describe you (the more the better):*

Intelligent	Imaginative	Methodical	Confident
Curious	Argumentative	Thorough	Controversial
Thirst for knowledge	Good concentration	Good at teaching yourself	Independent thinker
Stubborn	Dedicated	Pro-active	Ambitious
Prefer to control your own destiny	Good communicator	Bored by easy work	Desire to make a difference
Original	Literate	Dynamic	Cynical
Good at planning	Want to be the best	Self-motivating	Visionary
Can accept criticism	Willing to learn from others	Can admit mistakes	Well-organised

<div style="background-color: #0056b3; color: white; padding: 5px;"> 0. BEGINNING Throw away sanity to start </div>						
<h2>The Ph.D Game</h2>						
1. Your supervisor gives you project title. Go on 3 spaces		3. You are full of enthusiasm. Have another turn.	4. Realise supervisor has given nothing but project title.	5. Go to Library. You can't understand catalogue! Miss one turn.	6. The important reference has gone missing in the library. Back 2 spaces.	
	13. Things don't go well. You become disillusioned. Miss one turn		11. Examiners not impressed by first year report. Throw 1 to continue	10. Do extra work on first year report. Extra turn.	9. Supervisor makes a comment you don't understand. Back 2 spaces.	8. Need supervisor's help. Miss one turn finding her.
15. You become depressed. Miss 2 turns.	16. You become more depressed. Miss 3 turns.	17. Change project. Go back to beginning	18. Change supervisor. Throw 6 to continue. Otherwise go back 6 spaces.	19. Do lab demonstrations to get some dash. Go on 2 spaces		21. Lab demos take up too much of your time. Back 4 spaces.
28. You begin to think you will never finish. You are probably right.	27. Beer monster strikes. Spend 1 turn recovering.	26. Work every weekend for two months. Go on 6 spaces.	25. END OF SECOND YEAR No results. Who cares?	24. Experiments are working. Go on 4 spaces.	23. Specimens incorrectly labelled. Go back to 20.	
	29. You spend more time complaining than working. Miss 1 turn.	31. You realise your mates are earning 5 times your grant. Have a good cry!	32. You are asked why you started a PhD. Miss a turn finding a reason	33. You are offered a job. You may continue, or retire from game.	34. Start writing up. Now you are really depressed.	
42. Your PhD is awarded. Congratulations! Now join dole queue!	41. You are asked to resubmit thesis. Back to 33.	40. You decide PhD isn't worth the bother. Withdraw now. Game over.	39. Harddisk crashes. Back 3 spaces	38. It proves impossible to write up and work. Go to 33.	37. Your thesis will disprove external examiners' work. Go back to 28.	36. Your data has just been published by rival group. Go back to 28.

- *The PhD is awarded to a candidate who, having critically investigated and evaluated an approved topic resulting in an independent and original contribution to knowledge and demonstrated an understanding of research methods appropriate to the chosen field, has presented and defended a thesis, by oral examination, to the satisfaction of the examiners.*

Council for National Academic Awards, UK

- An original contribution to knowledge and/or understanding
- Undertake a systematic enquiry
- Apply methods appropriate to the subject
- A grasp of context
- Documentation and communication in a permanent form
- Sustained and contextualised logical argument
- Justification of actions in relation to process and product
- Valid and original work of high quality

- However, those working in the arts and humanities have created some definitions of PhD research more relevant for these fields:
- It must define a series of research questions that will be addressed or problems that will be explored in the course of the research. It must also define its objectives in terms of answering those questions or reporting on the results of the research project.
- It must specify a research context for the questions to be addressed or problems to be explored. You must specify why it is important that these particular questions should be answered or problems explored; what other research is being or has been conducted in this area; and what particular contribution this particular project will make to the advancement of knowledge, understanding and insights in this area.
- It must specify a methodology for addressing and answering the research questions. You must state how... you are going to set about answering the questions that have been set, or exploring the matters to be explored.

- Check your eligibility (qualifications, funding, English language, ability, project, supervisor)
- Check out the universities and departments (and locations) you think are most appropriate for you.
- Meet the potential supervisor, make sure you get along.
- Talk to his/her existing students to see what it would be like in the group.
- Write a research project proposal with the help of the supervisor.
- Apply.
- Have an interview.

From: hopeful.student@someyahooadress.com

Subject: doctrel program inquiry

To: someone.obscure, someoneelse.obscure, someother.person,
yetanother.person, ...and 58 others.

4 Attachments, 8.6Mb

Dear Sir,

I very interested in database managment theory .here are my
application materiels and i hope you can offer me PHD
position. thank you.

sincerely

hopeful student

attachments: application.doc resume.doc certificatel.doc
certificate2.doc

From: hopeful.student@university.ac.uk

Subject: doctoral programme enquiry

To: peter.bentley

2 Attachments, 95Kb

Dear Prof. Bentley,

I am writing to enquire about PhD positions in your research group.

I am currently completing my M.Sc. on natural computation and found your book "Digital Biology" very helpful indeed. I am very interested in computer models of development and the origins of the immune system in early life and I have been told (and can see from your excellent publications) that your research group specializes in this area.

I attach my CV and a short description of a research project idea that I hope may interest you. If possible I would like to come to your lab and discuss this further with you.

sincerely

hopeful student

attachments: cv.doc researchidea.doc

- How do you solve problems?
- Let's say you must figure out a way to herd five cats into a pen (without using food or catnip).
- You've got one week to find the world's best possible solution to this dilemma. What are you going to do?
- Try thinking of the steps you would take to solve the problem. Be completely honest with yourself.

Were your answers like one of these?

- I don't know what I'd do.
- I'd try to talk to other people about the problem.
- I'd get some cats and try out different ideas herding them.
- I'd go and think about the problem for a while, perhaps finding something to read on the subject, and figure out the best solution.

- If your answer was (1) or (2) then you may be the kind of person who prefers a more hands-on supervisor, who would be able to suggest how to start tackling the problem and where to look for more information about it.
- If your answer was (3) or (4) then you may be a more independent student who prefers to be left alone to solve problems by yourself.
- However, your supervisor will still be able to provide useful advice, no matter what kind of person you are.

- Academic staff can be a mixed bunch of (sometimes strange) personalities, e.g.:
- **professor wannable** – someone whose entire goal in life is to work his way up through the ranks
- **tired teacher** – someone who stays at the same university for most of his life
- **ex-industry** - a person who may have spent years in industry before giving it up (and giving up a good salary) in search of a more interesting life.
- **salesmen or businessmen** – so interested in talking about or exploiting the results of the research, either through the media or via industry, that they may exploit you.
- **fashion-hoppers** – they never stay with one research topic more than a year or two before hopping to the next fashionable area
- **born researchers** – not always very interested in teaching or careers, but totally dedicated to their research and their vision.

National Institutes of...

THE NINE TYPES OF PRINCIPAL INVESTIGATORS

Big Talker

These results have clear implications for the cure of cancer in our lifetime

(+) Makes your data seem really important
 (-) Doesn't really understand what you do

Slave Driver

You know, 60 hrs a week just isn't going to cut it in this lab

(+) You get lots done
 (-) You forget your spouse's name

Demi God

(+) Power, prestige, better job prospects
 (-) You never see them

Control Freak

Why didn't you use 25mM NaCl in the second wash?

(+) Knows exactly what experiment you're doing
 (-) Knows exactly what experiment you're doing

Science Wonk

Why don't you try this new reverse gyropismatic amplifying DER technique?

(+) Knows everything about science
 (-) He's a total geek

Laid-Back

Make it quick, I've got a 2:00 tee-time

(+) Leaves you alone
 (-) Doesn't care about your results

Psycho

WHAT DO YOU MEAN YOU MADE A MISTAKE!?

(+) Keeps you on your toes
 (-) Scary

Small Town Grocer

(+) Happy with his own little niche
 (-) Little Ambition

Rising Star

(+) Exciting Ride
 (-) Not much room for you

- The PhD application form includes a section for you to write your proposal.
- Your potential supervisor should give advice (or even help write) the research proposal.
- Applying for a PhD without meeting or discussing your idea means the choice of supervisor is out of your hands and you may even be rejected because no-one responded to the application in time.

Typical questions:

- *Why do you think you'd like to do a PhD?*
- *What do you think a PhD entails?*
- *What do you think are the best and worst parts about doing a PhD?*
- *Why do you think you are suited to do a PhD?*
- *So you're interested in X. Tell me what you've done in the area and what you'd like to do for your PhD*
- *Let's say you design and create something during the course of your research, but even though you try very hard you can't make it work. What will you do?*
- *You haven't qualified for our studentship place; how are you going to pay the tuition fees and cover your living expenses?*
- *What attracted you to our university?*

Don't believe everything you read

- *Researchers are not always very good at writing clearly. Sometimes they are not even very good at research. But that does not stop them from writing.*

Keep careful records, and keep the records carefully

- *"I read a hundred papers two years ago but I can't remember any of them."*
- *"I know I did all those experiments at the start of the PhD, but it was so long ago that I've forgotten the details."*
- *"I left my notebook on the train and I've lost everything."*
- *"there was a hard disk failure and I've lost everything."*

Look after your finances – make a budget and stick to it

- *Over the years I've supervised rich students and poor students. Some were lucky enough to get good funding and have wealthy parents. Some paid every penny from their own savings. Without exception, by the third year they all were struggling financially, with most needing to take part-time jobs to pay their bills.*

Break the work into a series of smaller projects

- It's good to have something to look forward to. When you've written up or published each new result, you can reward yourself with a short break, a nice meal or a treat, before moving to the next target.
- It's a great way of managing your time and enabling you to achieve something big, one step at a time.
- It gives you plenty of practice with all of the important skills you need to learn during a doctorate: writing, presenting and defending your work, meeting other researchers in the field.
- It ensures that as much of your work gets published as possible, which means it will undergo peer review and will be more likely to satisfy your PhD examiners.
- It makes writing your thesis much easier as you will have written down most of your work already.
- Even the process of writing helps you to understand the ideas better, so articles and papers enable you to clarify your thoughts and progress faster.
- It's a way of managing your happiness – frequent achievements make you feel good.

Remember to get your admin, reports, vivas and courses done

- PhD supervisors rarely remember all the administration that needs to be completed for your PhD. It is normally considered your responsibility to make sure everything that needs to be done, gets done.

Who's the first author?

- One of the most common causes of conflict between academics (and between students and supervisors) can be authorship of papers and articles. It may seem like a very trivial point, but if you've spent two years working on a paper with no help from your supervisor and then he insists that his name appears as the first author, you may be very annoyed.
- Find out the policy of your supervisor before you write anything.
- I believe that an author should contribute to the text of a paper (hence the word "author"). Authors should be listed in order of the actual content provided by each individual. If someone contributed intellectually but did not provide any input into the paper, they should be acknowledged in an acknowledgments section, but not listed as an author. If someone provided a small amount of content or editing, then they may be listed as a last author.

Give credit to others when it is due

- One common source of confusion for new students is how to refer to contributions to their work that have been made by other people.
- You would want others to credit you for your work, so you must do the same for them. Always cite the original source, and remember that you don't need permission to summarise, criticise and cite, but you do need permission to duplicate.

Listen to your supervisor; if unhappy talk to him or to someone else

- Your supervisor is your mentor, your councillor, your confidence-builder, your tutor and your guide. If you have a problem about anything, including them, you should first try to talk to them about it. A frank and open discussion will normally resolve most problems. Also remember that just because your supervisor may give you advice that you don't agree with doesn't mean he's wrong or incompetent. Do try to listen carefully to what your supervisor suggests. Their words are rarely random, and they are usually more likely to help than hinder.
- However, if you feel that something is not right then don't be afraid of going to talk with someone else.

Is it going to be in your thesis?

- Learning to focus on a single topic without being distracted by all the interesting things around it is very difficult. The test you use to check if your work is still on track is very simple:
- Ask yourself whether the work will be written in your thesis. Imagine which chapter it will go into. Think about how it will form a coherent part of a single theme; how it will provide more evidence to support your central hypothesis. If the vast bulk of the work will end up in an appendix – why are you spending so much of your time on it?

Insomnia happens to everyone

- Insomnia is just one of many stress-related problems that most PhD students experience during their doctorate. Stress is most common when you're obsessing about some aspect of your work and you're not giving yourself enough time off. It's made worse if you work at home because you may find it harder to get away from the work, and may keep returning to it at all hours of the day and night. To relieve the stress you need to discuss your problems with your supervisor, friends or colleagues, not take sleeping pills.

You're not the first person to do a PhD

- We all go through difficult times during our doctorate. Sometimes it's hard to know whether what you've done is worth a doctorate. The solution is simple. Borrow a few copies of previous PhD theses from your department and read them. You can use exactly the same trick when you need to write a paper. Just find several examples of papers that were published in the same journal or conference and read them.
- You are not the first person to do a PhD. Even if you can't learn anything relevant from what other people did in their research, you will always be able to learn from *how* they did their research.

Communication can be fun

- Writing and public speaking are very common fears of students.
- Reading a lot will help your writing. Listening to many presentations will teach you how to present your work better. The best advice I ever had was given to me by a friend who liked ballet dancing. She simply told me to enjoy myself. They're all listening to you, she said, so enjoy being the centre of attention.

Enjoy yourself!

Your doctorate is going to be hard work. But that doesn't mean it won't be fun.

Questions?

Bentley, P. J. (2006) *The PhD Application Handbook*. Open University Press.