About your Chef

- MSc Software Engineering (Softies2k3), PSG Tech, Graduated 2008
- Application Developer, ThoughtWorks (Bangalore), 1 year
- MS Computer Science, Georgia Tech (Atlanta), 2 years
- Software Developer, Yahoo! (Sunnyvale), 2 years
- PhD Computer Science, Purdue University / UC Santa Cruz, 5 years
Let’s Cook!
Why?

Do you like research?

What do you want to do in future?

Do you care a lot about $$?
What?

What do you like?

What does future look like?

What undergraduate subjects did you well on?
Where?

Which universities do related research?

Rankings are good proxy but may lie

Faculty ranking matters more than university ranking

Advisor is more important than both

Duration, visa requirements and work permits
When?

In Australia, Autumn starts in March

Deadlines for applications, scholarships, IELTS, etc.
How?

- Make your own timetable.
- Study for tests.
- Apply.
Build up your research profile

CV, recommendation letters, getting in touch
You are awesome, but no one's perfect!
Believe in yourself...

- Work hard on your weaknesses.
- Turn them into your strengths.
- Follow footsteps of others.
- Not a great GPA? Do great on your Masters project, get a paper out of it.
...and others will start having believing in you!

- Get recommendation letters
- You are not famous – yet
- Your Masters advisor may be
- You must be good if recommended by someone good.
Get in touch

- Dear Professor, Dear Sir/Madam
- Explain your previous research
- Explain why you have reached out this particular person/group.
- Professors get many emails like this. Differentiate and show that you care.
Check box

- Target universities identified.
- Entry tests.
- Recommendation letters.
- CVs and publications.
- Letter to potential future supervisors.
Appetizer

Congratulations! You are now a PhD student. Early year(s)...

![Onions](image-url)
Everything’s great, now let’s change the world!

Well,... except that, you probably won’t!
Your PhD project

- Pick something that your advisor cares about.
- Pick something that you like.
- Pick an area which is not too mature.
- Pick an area which is not too immature.
- Pick an area which is trendy.
  - Too trendy: high competition
  - Not trendy: less impact and recognition.
- Pick something that you can do.
Your advisor

- Pick an advisor which is well-known in the field.
- Junior advisors may spend more time with you but may lack experience.
- Senior advisors may be “too busy”.
- Look how successful their previous students are.
- Get feedback from their current students.
- Learn about their supervision style.
PhD probability density function

Before the peak:
- Lots of reading
- Lots of failing experiments

At the peak:
- You know your area → first paper

After the peak:
- Lots of writing
PhD Cumulative density function

- You need to start early.
- Don’t waste time in early years.
- At the end of your PhD you’ll have so many ideas
  - Save some time for writing them!

#papers, Success

Time (#years, #semesters)

\[
\begin{align*}
k = 1, \theta = 2.0 \\
k = 2, \theta = 2.0 \\
k = 3, \theta = 2.0 \\
k = 5, \theta = 1.0 \\
k = 9, \theta = 0.5
\end{align*}
\]
To get to the peak earlier:

- Read
- Read
- Read
- Read
- Read
- Read
Read...

- Identify the top conferences and journals in your field and read as many papers as you can.
- Identify the top authors in your field and read their papers.
- Follow the citation graph and read the related papers.
- Summarize each paper you read in a few sentences.
- Read critically.
Do ... take part in regular paper reading groups, or start your own. It's often much easier to ask stupid questions when you're in a forum run just by students.

Filip Radlinski
@firadl
Main dish

Get your hands dirty with experiments
Your PhD shelf

- \LaTeX
- Vim, emacs, MS Word
- R, Matlab
- Scripting languages
- IR toolkits: Lemur, Indri, Zettair, Terrier etc.
- Data
  - TREC
  - Query logs
  - Tweets, blogs etc.
Bash Scripts Are Your Friend!

- Same pipeline with different parameters and on different datasets.
- Run experiment, compute stat tests, generate plots and latex tables.
Baselines

• Identify the state-of-the-art baselines.

• Implement them and make sure that your results are consistent with published work
  • If not, you **have** to understand why.
  • Contact the authors if needed.

• Be fair to your baselines:
  • Implement them as carefully as you do your own work.
  • Train and tune them with the same data and features when possible.
Developing your ideas

- Start with easy and incremental ones.
- Look into the raw data and to find patterns.
- Run oracle experiments.
- Run tons of experiments.
- Use source control tools.
- Build new testbeds and release them.
Don’t shy away from coding. Get stuck in and make a prototype. Look to theory to provide an underpinning for your research, and consider how the empirical research you are doing fits into this bigger picture.

Leif Azzopardi
@leifos
Get feedback

- Talk to as many people as possible about your work.
- Learn how others tackle their problems and compare with yourself.
- You should be able to explain your work to a non-technical person.
- You should be able to convince experts about your work.
Don’t give up soon, but fail early

- Things usually don’t work when tried first.
- Go deeper, ask for help and debug.
- Be flexible. If something’s not working & is unlikely to work,
  - Then move on.
  - Don’t spend too much time on it, no matter how much you’ve already spent.
Back it up!

"They all say they're agnostic, until it's time for diagnostics."
Hatch Out

Papers & Presentations
Be organized & Plan ahead

SIGIR, Abstract deadline
Time to publish

• Start early. If you don’t have a paper, write a poster.
• Doctoral consortia are great for getting early feedback.
• Collaborate with other – more experienced – students.
• Don’t focus on a single conference only.

• Don’t rush it too much.
  • Don’t submit half-baked papers due to time pressure.
  • Sometimes it’s worth waiting for a better conference.
Proof read your work

- Spelling mistakes are unacceptable.
- Going beyond the page limit is unacceptable.
- Mathematical mistakes in formulas are unacceptable.
- Misrepresenting previous work is unacceptable and unethical.
Choosing the right title

- Descriptive: not too short, not too long.
- The reader should be able to guess from title what your work is about.
- Avoid boring titles.
Abstract

- First part ➔ motivation
- Second part ➔ contribution
- Third part ➔ summary of the results
- Anyone should be able to describe your work based on abstract without having to read the whole paper.
Introduction

- Opening paragraphs set the tone.
- Avoid cliché.
- Clearly describe the motivation behind your work.
- What is your signature dish?
- Back it up with examples and screen shots when possible.
- Describe what the reader should expect to find in remaining sections.
Related work

- Be comprehensive.
- Group them based on topics.
- Don’t be vague.
- Provide more details for more relevant papers.
- Be clear about their differences compared to your work.
- Avoid self-citation unless really necessary.
  - Refer to your previous work in third person.
Writing style

- Be consistent
  - British vs. American spelling
  - Capitalization
  - Tables, Figures, Captions and notations

- Be formal
  - Don’t use “I”.
  - Don’t use “don’t”!
  - Don’t use exclamation mark!!

- Define the acronyms before using them.

- Be efficient, do not rant, do not ramble.
Tables & figures

• Follow the same style.
• Usually, captions are above tables and below figures.
• Avoid short captions. Ideally, the text in the caption should be enough for the reader to understand the figure (or table).
• Legends, axes and labels should be easily readable.
• Plots should still be clear on a black and white print.
• Do you need error bars or statistical significance tests?
Results

- When possible report results on publically available datasets
- Explain the features clearly.
- Explain which features were most effective.
- Failure analysis is key, don’t just report numbers.
- Compare with state-of-the-art.
Acknowledge whoever has helped

I’m grateful to the following Chefs in alphabetical order,

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• Maarten de Rijke
• Vanessa Murdock
• Kira Radinsky
• Filip Radlinski
• Paul Thomas
• Vishwa Vinay
• Justin Zobel (check his book on “writing for computer science”).
Get your paper proof-read by others

- If something’s confusing for proof-readers it could be confusing for reviewers too.
- Your first papers will come back with lots of comments.
  - Don’t worry, you’re not the only one.
  - It gets better as you write more.
Don’t leave things to last minute

- Plan in advance.
- Get the first draft ready & iterate.
It probably will be last minute anyway...

- Some things will be out of your control.
- You may not get so much sleep for a few days – be prepared.
- Set your clocks to Samoan time!
Relax!
You’re not done yet...

- You’re expected to address the issues raised by the reviewers.
- Take the feedback seriously but not personally.
  - Appreciate them and improve your work.
- In cases where you have to address them in a letter:
  - Make sure you have understood the points & be polite.
Presentation

Well-presented food tastes better
Presenting your work

- Get inspired by watching great speakers.
- Wear comfortable but not too informal.
- Practice your talk but not memorize it.
- Don’t read from your notes.
- Open with interesting slides.
- “Outline slides” are often boring.
Presenting your work (cont’d)

• Dense slides are confusing.
• Minimize text, equations and animations
• Speak clearly and don’t rush your words.
• Make sure people at the back can see and hear you.
• Don’t skip too much.
• Finish on time.
• Thank the audience.
Handling questions

- Don’t panic.
- You know your work better than anyone else.
- Don’t get angry and don’t take it personally.
- Make sure you understood the question.
- Don’t get into long arguments.
- Have the courage to admit mistakes and shortcomings.
Life outside the kitchen

Internships, guest visits
• Learn more about industry research.
• Experience a competitive job interview.
• Work on something different.
• Meet and work with new people.

www.theinternshipmovie.com/

The Internship

Hiring them was a brilliant mistake.

In Theaters June 7
Collaborate like crazy, and broaden your academic network: Discover if there are opportunities to spend part of your PhD in another university, working with another research group. There may be funding or scholarships, plus it’s a great way to see the world and experience life in a different environment.

Peter Bailey
@peter_r_bailey
Get a life!

- PhD is not your life.
- “Healthy brain lives in a healthy body” – *Persian idiom*
- Regularly take some time off to do something else.
- If you ignore people around you, they’ll start doing the same after a while.
Frustration

• We’ve all been there...
• Remember, “If we knew what we were doing it wouldn’t be called research” – (Albert Einstein)

• Consult with others.
• Ignore negative comments about slow progress.
• Don’t panic if others have published more.
  • You can’t compare fields.
  • Quantity does not matter.
Take charge

• Look, let’s be very clear:
  • It’s your PhD
  • It’s your life
  • … and your advisor does not care as much as you think about you!
Dessert

Writing up your thesis
Writing your thesis

- Start writing early, otherwise
  - It gets harder, and you may forget/lose things.

- Resist running more experiments unless really essential.

- Get multiple people proof read & iterate.

- Proof read reversely at least once starting from the last chapter.
Enough is Enough!

• Don’t be a perfectionist.
• If you really miss it you can always do a post-doc.

• Don’t forget that:
  • You are getting older.
  • There’s more to learn – $\text{and to earn}$ – out there.
The PhD is not the greatest work of your life – it is a proof of concept that you are capable of doing a project of that scale mostly by yourself, so that when you leave school and are working in a team of people, it is clear that you will have a contribution. The important part is to complete it and move on without delay, to get to more interesting work. (From Bruce Croft.)

Vanessa Murdock
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Thank You,
Good Luck,
& Bon Appétit...

Feel free to contact me if you have any questions:
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