The Grad Student's Guide to Surviving your PhD
Don’t Panic
a very succinct guide that may help you to survive your PhD

Jilles Vreeken
Disclaimer

1) I’m not the “useful” type of doctor
1) I’m not the “useful” type of doctor.  
2) Any advice you’ll get is useless.

Don’t ask **survivors** for advice.  
"*Russian roulette is a great way to make money!*"
Disclaimer

1) I’m not the “useful” type of doctor.
2) Any advice you’ll get is useless.
3) This is not a scientific presentation.
I used to think correlation implied causation.

Then I took a statistics class. Now I don’t.

Sounds like the class helped.

Well, maybe.
Disclaimer

1) I’m not the “useful” type of doctor.
2) Any advice you’ll get is useless.
3) This is not a scientific presentation.
4) I stand on the shoulders of giants.

and many, many others
Let’s start with the best advice you’ll ever get...
DON'T PANIC
I’m not afraid.
Yes...
you will be.
You will be.
Time of Disillusionment

I have some **bad** news for you

Doing a PhD will help you find out

- there are people who are better than you
- you are not good at everything
- being good at courses is not enough
- doing what you are told may not be enough

And, most prominently: **life is unfair**

- people less smart or hard-working will be luckier, get better results
- people who have done worse work will end up with better jobs
First things first

Why do a PhD?
Its gonna make me rich!
Its gonna make me rich!

NO.
Salary by Degree

Years of Experience (corrected)

Yearly Salary in EUR

<1 1-4 5-9 10-19 20+

BA/BSc
PhD
Years of experience explains 28% of the variation in salaries. Knowing whether you are a manager or have a PhD add another 4 percentage points.
Years of experience explains 28% of
5 extra years of experience worth more than a PhD!
PhD add another 4 percentage points.
Some degree-less people

![Image of a person with a $72bn label]

![Image of a person with a $10bn label]

![Image of a person with a $28bn label]

![Image of a person with an Amazon Kindle with a $27bn label]
Some degree-less people

Skill sets and interpersonal skills vs. academic qualifications.

$72bn

$10bn

$28bn

$27bn
You’re not in it for the money - So Why are You?
You’re not in it for the money -

Fluctuations in Grad Student Enrollment (Science & Engineering)

Fluctuations in the Unemployment Rate

Correlation Coefficient: $\rho = 0.75583$
(that's pretty high)

grad school is for suckers! wall street here i come!

Guess Who’s Coming to Grad School?

Sources: NSF/Bureau of Labor Statistics. Fluctuations obtained by subtracting the mean regression line from the absolute values.

www.phdcomics.com
First things first, again

Why do a PhD?
Because my PhD is gonna change the world and this is my plan...
Because my PhD is gonna change the world!

NO.
Because my PhD is gonna change the world!

Big Problems are Big because they are Hard

NO.
Because my PhD is gonna change the world!

World Changing Breakthroughs are *rare*, very *rare*. Once-a-career rare, *if* you’re lucky.

**NO.**
Because my PhD is gonna change the world!

Big Problems are Big because they are Hard. World Changing Breakthroughs are very rare, if you're lucky.

If you want to change the world, become a politician. if you’re lucky.

NO.
If you’re here for the right reasons...

Doing a PhD can be awesome

But, what is the right reason?

- you are **fascinated** by a topic,
- you need to know, you want to discover
If you're here for the right reasons…

Doing a PhD can be awesome

But, what is the right reason?

- you are fascinated by algorithms and data,
- you want to know, you want to discover

You’ll have to like both the big results and the little ones
What’s Great about Working in Science

Freedom!
- set your own agenda, schedule, ...

You get to travel regularly
- to Beijing, to Paris, to Barcelona, to Dallas, how cool ...

What dress code?
- I’ve seen keynote speakers in pyjamas

Invisible band uniting all geeks
- helpful, enjoy learning, similar language

Surrounded by people who never grew up
- smart kids who love to play
What’s Great about Working in Science

HOW GRAD SCHOOL IS JUST LIKE KINDERGARTEN

- All day napping is acceptable
- There is constant adult supervision
- You get cookies for lunch
- Most common activity: cutting and pasting
- There are no grades (you just have to play well with others)
- Crying for your mommy is normal

WWW.PHDCOMICS.COM
What’s Great about Working in Science

Working in science is amazing ...

... if you appreciate its benefits.
Perspective

Industry, according to academia
Perspective

Academia, according to industry
Perspective

Industry, according to academia

researchinprogress.tumblr.com
There’s stress everywhere. Just different kinds.

Industry, according to academia
What is a PhD?
What is a PhD? science?
What is a PhD?
What is a PhD? Science?

Because!

Science is about discovering things we didn’t know.
What is a PhD?
What is a PhD?

No, really, what is a PhD?
and
keep pushing.
Before you begin, let me just say I don't want to hear about any problems or difficulties you've been having.

I don't want to hear any excuses or extenuating circumstances.

The only thing I want to hear is what you're doing about it. What's your plan to resolve the situation?

My plan was to come here and have you tell me what to do. You need a new plan.
You & Your Advisor

- You are 1 of $N$ students
- Your paper is 1 of $M$ papers
- (S)he reviews $P$ papers a year
- (S)he teaches $Q$ courses a year
- (S)he attends $X$ committee meetings a week
- (S)he travels $Y$ times a year

Do the math!!! (S)he only has

$$\frac{(365 - 14 - 52 \times 2 - 5Y) \times \left(8 - \frac{X}{5}\right) - 4P - 3 \times 16Q}{52 \times N \times M}$$

hours /week for you

$N=5$, $M=10$, $P=20$, $Q=2$, $X=5$, $Y=4$

answer = 0.54
Do the math!!! (S)he only has
\[ \frac{(365 - 14 - 52 \times 2 - 5Y) \times \left(8 - \frac{X}{5}\right) - 4P - 3 \times 16Q}{52 \times N \times M} \]

hours /week for you

\[ N=5, M=10, P=20, Q=2, X=5, Y=4 \]

answer = 0.54
...SO, PROF. JONES, I'M TOTALLY STUCK! WHAT SHOULD I DO?

HMMMM...

WELL, YOU SHOULD PROBABLY FIX IT.

THAT'S IT? THAT'S YOUR ADVICE?

YOU SHOULD DO IT SOON, TOO.
You & Your Advisor

Keep your advisor up-to-date, but don’t spam
■ Be interesting, not pestering

Agree on and check against SMART goals
■ Specific, Measurable, Attainable, Realistic, Timely

Try to phrase suggestions, not questions
■ “I think we should do X” vs. “Should we do X?”

There are other helpful people, you know?
■ officemates, postdocs, fellow students
You & Your Advisor

Keep your advisor up-to-date, but don’t spam
- Be interesting, not pestering

Agree on concrete goals.
- Specific, Measurable, Attainable, Realistic, Timely

Try to phrase suggestions, not questions
- “I think we should do X” vs. “Should we do X?”

There are other helpful people, you know?
- officemates, postdocs, fellow students
What is a PhD about?

Learning how to do science, such that you become an independent researcher.

EVERYBODY'S PUBLISHING

AND I'M JUST SITTING HERE...
What is a PhD about?

Learning how to do science, such that you become an independent researcher.
What is a PhD about?

**Learning** how to do science,

such that you

**become** an independent researcher
What is a PhD about?

Don’t compare yourself to more senior people. such that you become an independent researcher
All these papers are so nice...
All these papers are so nice...

and my research is not going anywhere...
All these papers are so nice...

Published papers are smooth representations of long and messy processes and my research is not going anywhere...
Reaching the Goal
# Reaching the Goal

<table>
<thead>
<tr>
<th>The objective schema can lead to frustration when the project goes off track</th>
<th>The nurturing schema gives support and opens new directions</th>
</tr>
</thead>
</table>

![Diagram showing the difference between objective and nurturing approaches](weizmann.ac.il/mcb/UriAlon/nurturing/HowToChooseGoodProblem.pdf)
## Reaching the Goal

<table>
<thead>
<tr>
<th>The objective schema can lead to frustration when the project goes off track</th>
<th>The nurturing schema gives support and opens new directions</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

[Reaching the Goal](weizmann.ac.il/mcb/UriAlon/nurturing/HowToChooseGoodProblem.pdf)
A good **problem** is often worth more than a good **solution**!
We’re explorers
- we may strike gold, or
- find dirt, dirt, and more dirt

We don’t know the way
- we follow intuition, and see where it leads us...
- soon, you’ll know ‘the way’ better than your supervisor

Are you afraid of the Dark?
We’re explorers, we may strike gold, or find dirt, dirt, and more dirt. We don’t know the way. We follow intuition, and see where it leads us… soon, you’ll know ‘the way’ better than your supervisor.

Are you afraid of the Dark?

If you’re afraid of the dark research is not for you.
How to work

Everybody works differently

- find out what works for *you*
I'M NOT A MORNING PERSON
How to work

Everybody works differently
- find out what works for you

It’s not about how many hours — stupid !!1!!!one!eleven
- say no to peer pressure

Create a stimulating environment
- optimize your workplace

Focus.
- and procrastinate when you can’t
How to work

Everybody works differently
- find out what works for you

It’s not about how many hours — stupid!!1!!!one!eleven
- say no to peer pressure

Create a stimulating environment
- optimize your workplace

Focus.
geek productivity at work

- how non-geeks think it works
- how it actually works

- sampling points likely to used by non-geeks to get a general picture of how geeks work

along the day:

copyright (c) 2013 Bruno Oliveira - bit.ly/brunooliveira - share freely
How to work

Everybody works differently
- find out what works for you

It’s not about how many hours — stupid !!1!!!one!eleven
- say no to peer pressure

Create a stimulating environment
- optimize your workplace

Focus.
- and procrastinate when you can’t
How to work

Everybody works differently
- find out what works for you

It’s not about how many hours — stupid!!
- say no to peer pressure

Create a stimulating environment
- optimize your workplace

Focus.
- and procrastinate when you can’t

PhD Goal:
figure out how you get ideas
I don't know man..

Sometimes, I don't want to move it move it.
Sometimes, it’s just not happening. No need to keep your chair warm, call it a day – go out, have **fun**. Who knows, maybe you’ll even get a good idea.
Sometimes...
WELL CRAP
Sometimes… You’re stuck.
DON'T PANIC
Sometimes…

You’re stuck.

I NEED AN ADULT
Don’t be afraid to ask for help.
When You’re Feeling Low

It’s not so bad, really
- don’t get yourself down

Acknowledge the good times
- keep a *folder* with past *accomplishments*,
  with e.g., graduation photos,
  acceptance notifications,
  awards, conference visits,
  etc.
When You’re Feeling Low

Everyday mood and emotions after eating a chocolate bar or an apple

Michael Macht *, Dorothee Dettmer
When You’re Feeling Low

Everyday mood and emotions after eating a chocolate bar or an apple

Michael Macht *, Dorothee Dettmer
When You’re Feeling Low

It’s not so bad, really. Don’t get yourself down. Acknowledge the good times. Keep a folder with past accomplishments, with e.g., graduation photos, acceptance notifications, awards, conference visits, etc.

public.randomnotes.org/richard/PhDtalk.html
When You’re Feeling Low

Who cares about “an apple a day …”, it’s: “a chocolate bar every 30 minutes”!

public.randomnotes.org/richard/PhDtalk.html
Survival Checklist

Put yourself in the shoes of your audience
- your advisor, your readers, conference attendees, ...

Get your priorities straight
- define achievable short-term goals and stick to them

Learn when to say no
- don’t get involved in too many things

Be thoughtful about networking opportunities
- personal story

from “A PhD is not Enough!”, Feibelman
Thanks and Good Luck!!

For pointers to books, slides, sites, ...

jilles@mpi-inf.mpg.de
Some references

Good Books
- “A PhD is not Enough”, Feibelman
- “Mastering your PhD”, Gosling & Noordman
- “How to Get a PhD”, Philips & Pu

Google [title] filetype:pdf
- “From Research to Manuscript”, Katz
- “Scientific Writing”, Peat
- “Writing for Science”, Goldbort

Informative Sites
- http://matt.might.net/articles/
- http://public.randomnotes.org/richard/

Funny Sites
- Research in Progress – researchinprogress.tumblr
- Piled Higher & Deeper – phdcomics.com

Great Slides
- Sue Moon “A few tips I wish I had before I met my advisor”
- Yannis Smaragdakis “PhD Rants and Raves – be afraid, be very afraid”
- Eamonn Keogh “How to do good data mining research, get it published, and get it cited”

Special thanks to Ingmar Weber for his excellent talk
- “Advice for young Jedi knights and PhD students” at PIKM 2012