

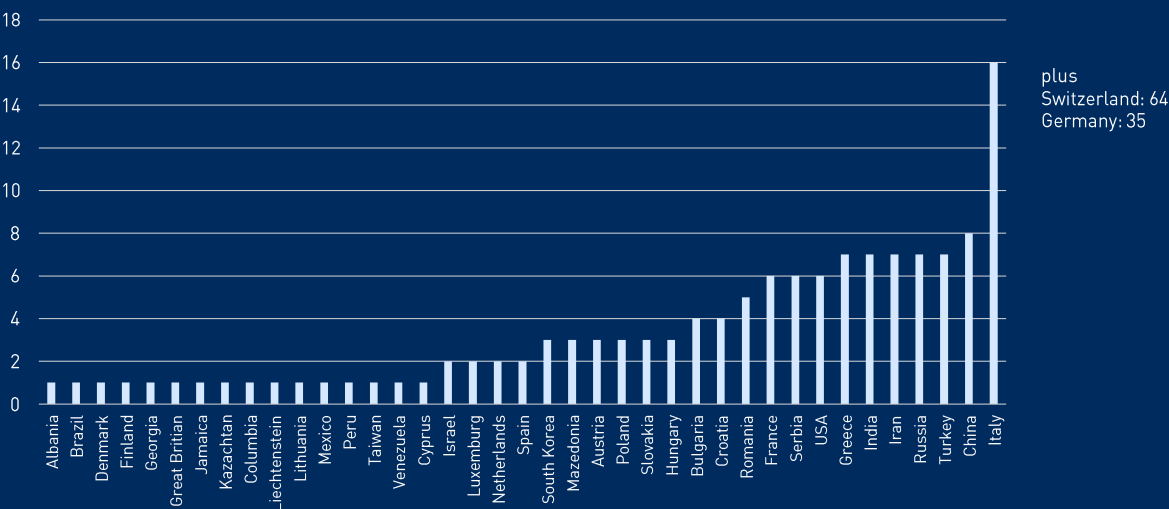
Doing a PhD (Doctorate actually) Computer Science @ ETH

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Computer Science
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Bild: Micha Lussi, ETH

PhD Students in 2017 (total 231)



Research ≠ Studying

Problems can be vague at first

You are the major driver

Irregular checks (meetings etc.)

Open-ended, no “good enough”

Exploration is crucial

Much time spent reading papers

Problems well-defined

Somebody tells you exactly what to do

Regular checks: classes/exams

Perfect = top grade

Little room to explore

Little time spent on related work

You Are In The Driving Seat! Be Proactive!

Be creative, have ideas, explore

Read papers

Monitor your progress

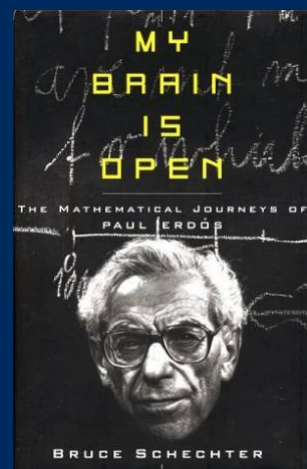
Talk to other researchers (in- and outside your group)

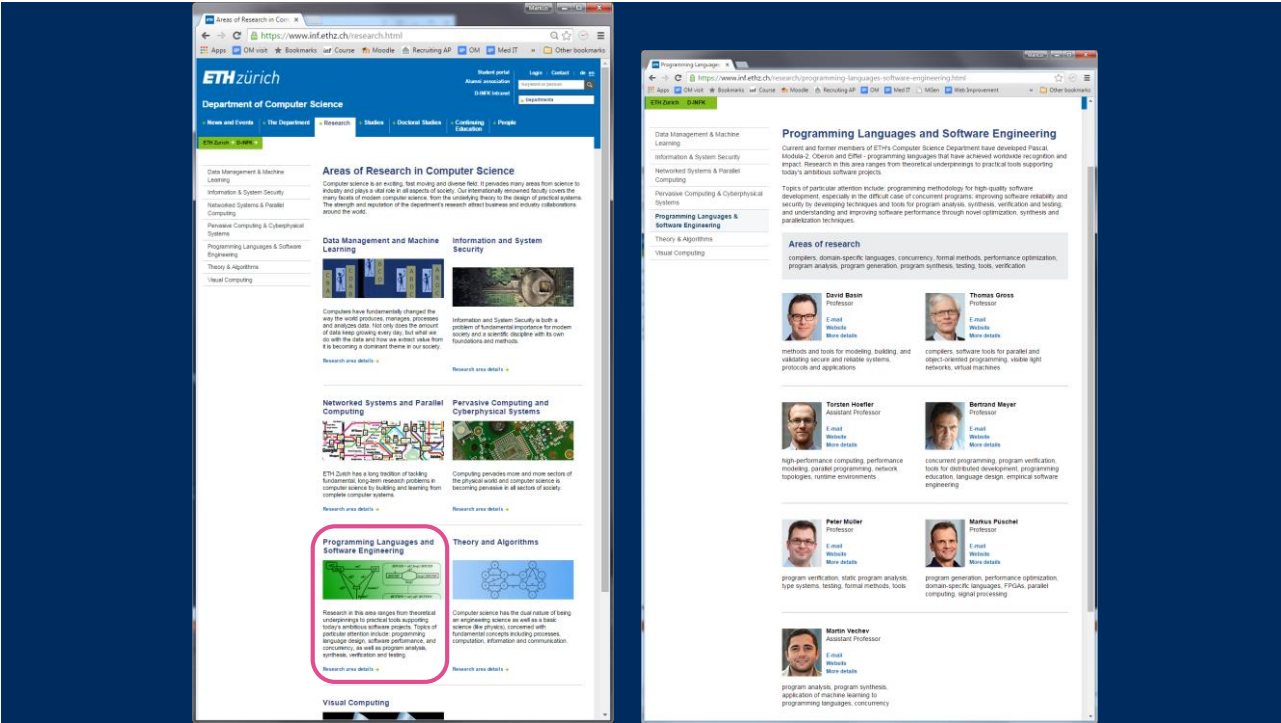
Communicate with advisor (progress, ideas, problems)

Go to our main colloquium and talks related to your work

Talk to people at conferences (= don't stick with your friends)

Problems? Talk to your advisor!





About Talent

There are always obvious differences in how quickly different people pick something up. Some just seem have an easier time playing a music instrument. [...] Some just seem to be naturally good with numbers. And so on.

And because we see such differences in beginners, it's natural to assume that those differences will persist—that the same people who did so well in the beginning will continue to breeze through later on. These lucky people, we imagine, were born with innate talents that smooth the way and lead them to excel.

This is an understandable result of observing the beginning of the journey and concluding that the rest of the journey will be similar.

It is also wrong.

source: *Peak: Secrets from the new science of expertise*, Anders Ericsson & Eric Pool

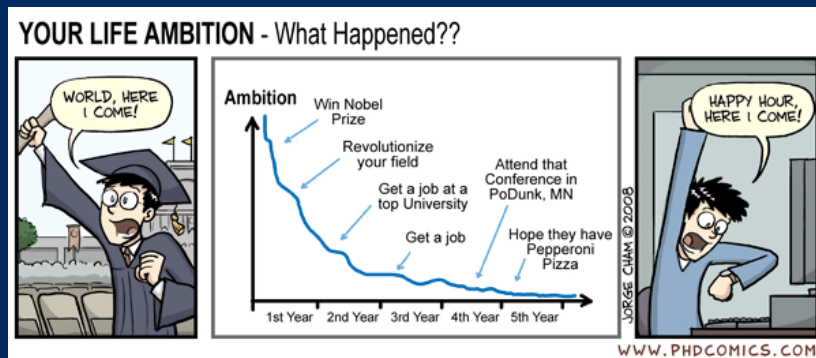
About Talent

In the long run it is the ones who practice more who prevail, not the ones who had some initial advantage in intelligence or some other talent.

People do not stop learning and improving because they have reached some innate limit on their performance; they stop learning and improving because, for whatever reason, they stopped practicing [...].

Message: focus, work hard, dig deep, aim high – the sky is the limit for all of you!
 don't be intimidated by the work of more advanced group members

source: Peak: Secrets from the new science of expertise, Anders Ericsson & Eric Pool



Aim for high quality

your research
your publications
your presentations
take pride in what you create

Work on your writing/presenting skills

Reading Research Papers

Be
Type 3



Type 1: "Who cares about prior work.
I just build my software/system/theory."

(And I don't want to read that somebody
has done it already.)



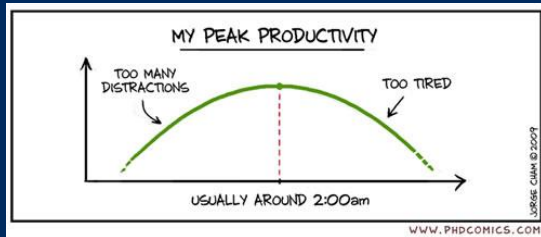
Type 2: "Oh my god, there is
so much research out there."

"I first have to read 10000000
papers before I can even think
about starting my work."

Donald Knuth (<http://www-cs-faculty.stanford.edu/~uno/email.html>):

Email is a wonderful thing for people whose role in life is to be on top of things.

But not for me; my role is to be on the bottom of things.



Be Smart with Your Time

work when you have "the flow"

don't fragment your time

use a calendar

keep a steady schedule

avoid permanent distractions (email, facebook, ...)

Find a Balance to Work



Find a Balance to Work



Find a Balance to Work

Sorry – that's the one impossible thing here



Integrity

Discovery and advancement of knowledge are not possible without a commitment to personal integrity, honesty, and ethical conduct

Examples

Assessment of your own work

Comparison to prior work – be proper and thorough

Acknowledgment of collaborators

Keep commitments

Be a good team member

Don't be full of yourself

Proper behavior with advisor:
you are given a lot of freedom – don't abuse it

Plagiarism



Be very careful!

Learn proper behaviour from your advisor and peers

A Word on Professional Communication

Rules at ETH and in our department

By email:

~~coolguy@gmail.com~~

yourname@inf.ethz.ch

Publications/presentations:

Markus Püschel

[optional additions] ← *Institute, Center, Lab, Group, etc.*

Department of Computer Science ← *Should be included*

ETH Zurich, Switzerland



No:

*Eidgenössisch Technische Hochschule
Swiss Federal Institute of Technology
ETHZ*

PhD: The Procedure

PhD in a Nutshell

Find thesis topic

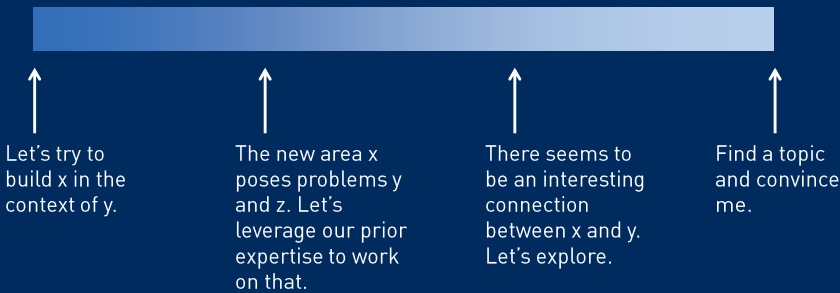


PhD research



Find Thesis Topic: Every Advisor Does It Differently

Some examples



PhD in a Nutshell

Get ≥ 12 credits [+ entrance exam]

Find thesis topic

Find thesis committee

PhD research

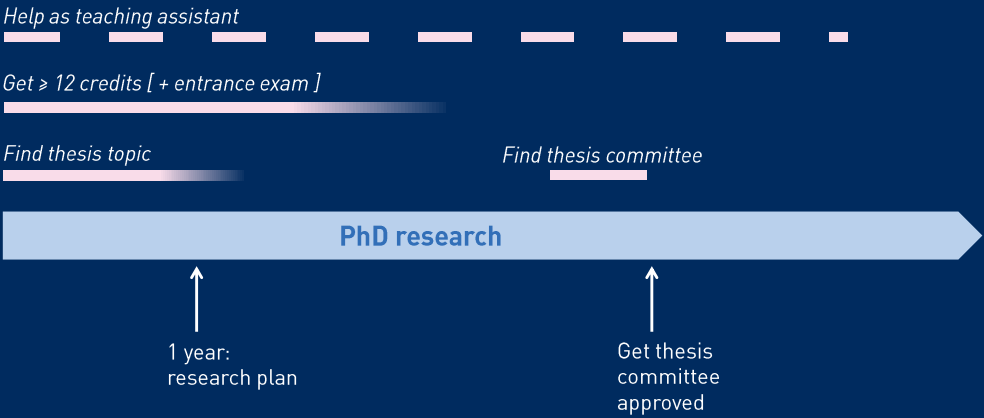
1 year:
research plan

Get thesis
committee
approved

Find Thesis Committee

- Together with advisor
- Needs at least one independent senior researcher (typically professor with tenure)
- Approved by doctoral committee

PhD in a Nutshell



Teaching Assistant

- Part of your training
- Part of the reason you get paid very well
- Decide together with advisor
- Frequency:** Every semester
- Rough work load:** one day/week
- Balance undergrad and grad courses
- German speaking people: consider first year/service courses

Embrace it – it’s fun & you learn a lot

Learning to Teach

This course imparts a variety of teaching skills which will help Doctoral Teaching Assistants with their teaching tasks.

Course content

- Basics of student learning processes
- Active student engagement
- Assessing students’ progress

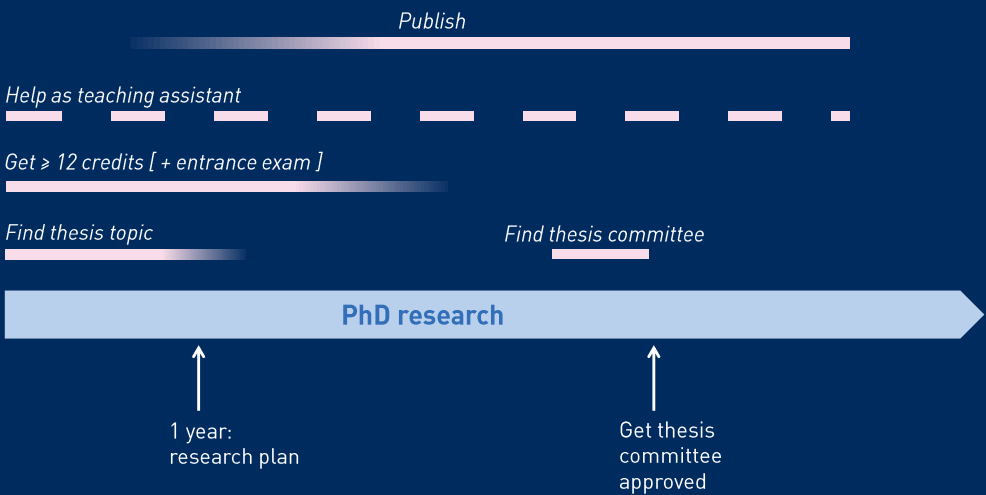
Is this course for me?

This programme is designed for ETH Doctoral Teaching Assistants with **current teaching responsibilities** (exercises, excursions, supervision of practicals, lectures, etc.) **or those who will assume teaching tasks in the semester following the programme.**

No previous teacher training is required.

ETH course run by LET

PhD in a Nutshell



Publications

In computer science, most (but not all) top publication venues are conferences

Big difference in quality

Aim for a few papers in top tier venues (as main author)

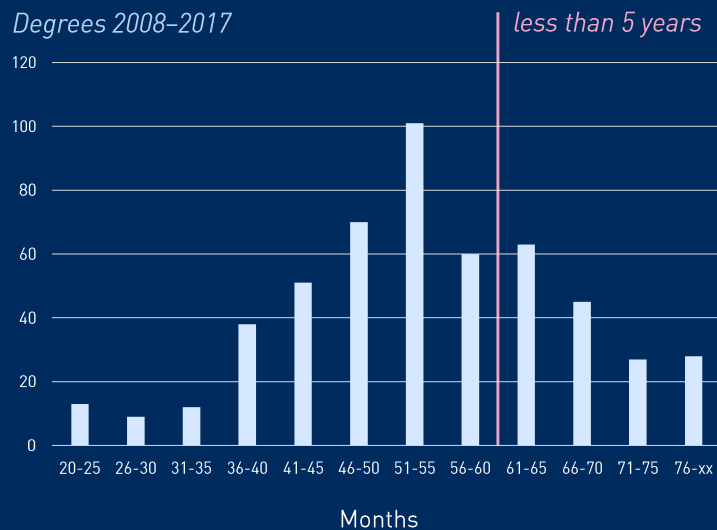
Contribute to other publications in your group

Offer Master thesis projects that may lead to publications

PhD in a Nutshell



What Is x?



Median = 4.5 yrs

*63 / 580
dropped out*

Doctoral Committee

Members: Ueli Maurer, Onur Mutlu, Timothy Roscoe



Tasks

- Decides on entrance exams*
- Approves credit transfers*
- Approves research plans*
- Approves thesis committee*
- Can help with problems*

Excellent Study Administration



Denise
Spicher



Marion
Wenger



Bernadette
Giansi



Toni
Joller

And Afterwards? It Looks Great!

International Postdoc/Industry
Your advisor has good connections
ETH highly visible as international top university

Local industry
Severe lack of computer scientists
Start-up culture

Local research
ETH, EPFL, ...
Industry
Research labs (CERN, PSI, ...)

2018	 <p>anapaya systems</p> <p>The i2C4H Internet architecture developed at EPFL is a disruptive technology that provides secure inter-domain routing, QoS, DDoS defense mechanisms, unified push-to-talk video, and an unprecedented level of scalability. Anapaya Systems leverages the i2C4H architecture to offer end-to-end secured, low-latency and address the fast and growing demand of today's Internet.</p> <p>Visit website (anapaya.ch)</p>
2017	 <p>Perceptiko</p> <p>Perceptiko is a computer graphics and vision startup from EPFL campus. The company develops software for enhancing video data through augmented reality.</p> <p>Visit website (perceptiko.ch)</p>
	 <p>SYNACTS</p> <p>Synacts develops connected video services that are based on the Digital TV protocol. Its smart technology connecting are directly used for the Internet and a backup layer for personal information. Synacts leverages our full control over the system to offer data and provides a secure, simple and automated way to exchange sensitive information over the web.</p> <p>Visit website ?</p>
2016	 <p>astrivis</p> <p>Astrivis develops software that turns any mobile phone into a 3D scanner. Just move the phone around an object and get it as a 3D model directly on the phone as a matter of seconds without external cloud processing.</p> <p>Visit website ?</p>
	 <p>DEEPCODE</p> <p>DeepCode changes the way we create programs by using powerful artificial intelligence and machine learning methods.</p> <p>Visit website ?</p>
	 <p>SPINNINCEYTES</p> <p>SpinninCytes finds the relevant information in your data. Research insights can be used for business decisions, process optimization or even new data products.</p> <p>Visit website ?</p>
	 <p>Neytiri GmbH</p> <p>The company seeks to provide education and advanced training and to develop teaching concepts, materials and software with focus in the field of information and communication technologies.</p> <p>Visit website ?</p>
	 <p>veezoo</p> <p>veezoo is a simple and powerful platform for data exploration.</p> <p>Visit website ?</p>
2015	 <p>Kapschu AG</p> <p>Kapschu AG brings visual computing technologies to industry.</p>

PhD Should Be a Fantastic Experience

Cutting edge work

Creative

You can show what you can do

Multimodal:
research, write, present, teach, travel, communicate, advise

Few distractions

Great environment

Make the best out of it!