Everything You Always Wanted to Know About the PhD But Were Afraid to Ask
PhD

1. What?
2. How?
3. Why?
4. EPFL?
What is a PhD?

A discovery

Any discovery?

Almost...

Non-triviality...
What is a PhD thesis?

Around 150 pages describing:
- how the world was before
- the actual discovery
- why the world is better now
Example: a theorem

The consensus problem is impossible in an asynchronous distributed system.

The consensus problem requires $t+1$ rounds in a synchronous system with $t$ failures.
Example: an algorithm

A $t+1$ synchronous consensus

A spam filter

A fake news detector

A recommender
Example: a programming language

Enabling model-checking

Simplifying parallel programming
Example: a new concept

A complexity metric to measure:
- the complexity of a program
- the efficiency of a network
Example: a new architecture

A hardware architecture

A new Internet
Example: a system

To P2P stream video

To detect network intrusions

To synchronize concurrent accesses to a shared memory
PhD

1. What?

2. How?
How?

Dive, dive, dive, dive,…

Until you find something
How?

The less subjective criteria: papers

Judged by peers

Sometimes anonymously
How?

(1) The first steps

You read few papers; you choose one; you improve it;

You build a system; you show it is better than all others (in some respect);
How?

(2) You become expert

You write important papers
How?

(3) The last sprint

You compile few papers into the PhD document
Is this challenging?

Yes

But

You will never walk alone
You will never walk alone

The lab

The school

The world
PhD

1. What?
2. How?
3. Why?
Why?

Freedom

Intellectual challenges

Work with interesting people
Why?

A diploma stating your ability to:

Dive

And tell the world about it
Why?

Researcher/Professor

Fast promotion

CTO: Yahoo, Akamai, Google,…
PhD

1. What?
2. How?
3. Why?
4. EPFL?
at EPFL?

Computer Science: Algorithms, computational biology, distributed systems, operating systems, databases, artificial intelligence

Computer Engineering: computer vision, processor architecture, computational vision, logic systems, computer networks, design and media

Communication systems: nonlinear systems, robotics, electromagnetics, wireless and mobile networks, coding and information theory, signal processing
At EPFL?

Nice and prestigious place

International atmosphere

Nice trips (conferences; internships)
At EPFL?

1st year – 5th year
Between 50,000 and 60,000 CHF
Apply mid December; Start in September

1. Courses: a wide range of advances topics

2. Research seminars: you pick the prof
3. Find a thesis supervisor

4. Pass the PhD candidacy exam
   - presentation of thesis proposal (20-30 min) followed by oral exam (20-30 min)
   - examiners: thesis supervisor and second examiner, presided by a third prof
   - exam: reading list (3-4 research papers) chosen 3 months in advance; before September 15, 2010; one retry within 3 months
At EPFL?

Apply in December

http://phd.epfl.ch/edic