Overview

- What is a PhD?
  - Grants
  - Finding a grant
- Publications
- Coping with the PhD
- Careers
What is a PhD?

- 3 years work on a research topic
  - In a research lab / in a company
  - Work as an employee (salary: 1500 - 2000 € per month)

- Output of the PhD work
  - Research results (publications, software, patents, ...)
  - A PhD thesis manuscript
    - In CS: approx 100 pages manuscript
  - A PhD defense
    - 45 minutes presentation of the research work + many questions
  -> A PhD degree
Why would you want to do that?

- Doing research is fun
- You get the opportunity to work on what you want
- A thesis can open job opportunities
  - In the industry
  - In academia
- You help to advance science
Imagine a circle that contains all of human knowledge. By the time you finish high school, you know a bit more.
Human knowledge

With a bachelor's degree, you gain a specialty.
Human knowledge

A master's degree deepens that specialty.
Human knowledge

Reading research papers takes you to the edge of human knowledge
Once you're at the boundary, you focus.
You push at the boundary for a few years.
Human knowledge

Until one day, the boundary gives way.
And, that dent you've made is called a Ph.D.
Of course, the world looks different to you now.
Human knowledge

So, don't forget the bigger picture.
Entering a PhD program

- A PhD requires
  - A PhD student
  - One (or more) PhD advisor
  - A research topic
  - A PhD grant

- The student and advisor should get along well
- The student should be interested about the research topic

- Master projects/internships are a good way to verify it
Getting a Phd grant

- PhD grant: 120k€ over 3 years
  - Includes a salary (1500 – 2000€ per month) + social contributions

- Types of PhD grants
  - Institution funding (AMX, Hi!Paris, IPParis, hosting lab, ...)
    - Apply in ~april, results in may/june
  - Research project (ANR, Horizon Europe, ...)
    - Apply in october, results in july
  - CIFRE funding
    - PhD in the industry

http://www-inf.telecom-sudparis.eu/COURS/masteripparis/hpda/?page=job_offers
A thesis = a set of research contributions

- Usually summarized in publications

What is a publication?

- Written article (usually around 10 pages) that treats one particular problem
- Peer-reviewed
- Published in a venue (journal, conference, workshop)
Venues

- Institution in charge of
  - Assessing the paper quality
  - Publishing the paper

- Main types of venues:
  - Conferences (main publishing venue in CS)
    - International Parallel & Distributed Processing Symposium (IPDPS)
    - Symposium on Operating Systems Principles (SOSP)
  - Workshops (small conference on a specific topic)
    - International Workshop on OpenMP (IWOMP)
    - International Workshop on Runtime and Operating Systems for Supercomputers (ROSP)
  - Demo/Poster session in conferences
  - Journals
Assessing a venue « quality »

- All venues exist in different « qualities »
  - It is very hard to get a paper into a good venue

- Identifying good venues
  - Your advisor knows
  - Look at your list of references
  - Conference/journal ranking
    - Google Scholar (based on H-index)
      https://scholar.google.com/citations?view_op=top_venues&vq=eng
(some of the) top conferences related to PDS / HPDA

- System: SOSP, OSDI, ASPLOS, EuroSys, Usenix ATC, DSN, VEE
- Distributed systems: PODC, ICDCS, DISC, OPODIS, SSS
- Parallel programming: ISCA, IPDPS, PPoPP, SC, ICPP, EuroPar, ICPADS, PDP
- AI: KDD, NeurIPS, AAAI, MLsys

Paper submission process

- Write a paper in a specific format
- Submit the paper for peer review
  - Conferences/workshops: submit before a deadline
  - Journals: submit anytime
- Paper is reviewed by anonymous experts
  - Assess paper weakness/strength
  - Grade the paper (accept/reject)
    → decision based on several reviews (usually 3+)
      - Conferences: accept / reject
      - Journals: reject / major revision / minor revision / accept
Frustration

- PhD work can be very frustrating and psychologically demanding
  - Rejected papers
  - Comparison with others can be depressing (Impostor syndrome)
  - Stalled development

- Seek help
  - Talk with your advisor
  - Talk with your colleagues / friend / family
  - Universities employ trained psychologist to help you
  - 30% of PhD students seek help

¹ PhDs: the tortuous truth – https://www.nature.com/articles/d41586-019-03459-7
Career

• Typical career in academia in France
  – PhD: 3.5 years – 1500-2000 € / month
  – Post-doc abroad: 2 years – 2500+ € / month
  – Associate professor (maître de conférence) / researcher (chargé de recherche): 10 years – 2000+ € / month
  – Full professor (professeur des universités) / senior researcher (directeur de recherche): 25 years – 3000+ € / month

• After a Phd in Computer Science
  – In France: 73% / overseas: 27%
  – Permanent position: 73% / fixed-term contract: 27%
  – Academia: 28% / Industry: 55% / Other: 17%
  – Median salary (in France): 41538 € / 43077 € (industry)

https://enquetes-sphinx.u-psud.fr/PHdFutur/PhDs_Future/PhDs_Future.htm
Census among 233 PhD obtained in 2016-2018 from Université Paris-Saclay