Welcome to the Department

Only slide with numbers!

- 40-50 PhD students
- 25 research staff (most of them post-PhD)
- 23 permanent staff
- 8 support staff

Located on 3 floors in this building:

- 1-st floor, Research lab (1.15)
- 2-nd floor, Research labs (2.01, 2.08), teaching labs (2.11, 2.10)
- 3-rd floor, Research labs + permanent staff offices.
What to get out of a PhD

• The start of a research career
  – to be continued in a commercial research lab, university or any company looking to employ creative people

• A good CV
  – You did something substantial
  – You wrote about it

• Lots of contacts
  – Here, other universities in the UK and abroad
  – Each contact is a potential job or reference.

• A good time

(The title)
What is research

- Discovering novelty
  - How to get there?
- Thinking critically
- Following scientific methods

- Never mind whether you are doing Cryptography or Image compression (or Philosophy or Astrophysics for that matter)
What is research: Novelty

- This is the hard part.
- Specific to the discipline.
  - New proof, new algorithm, new design, new experiment, new insight, new model, new ...
  - Watch the word “new”.
- A PhD will contribute something novel to the body of science.
  - A PhD thesis normally has a “hypothesis”, and then a proof / experimentation / argumentation that supports the hypothesis.
What is research: the process

This is the really hard part.

- It is usually not a linear process
- You can plan some things, once you have an idea of where you go
- Depends very much on the field, and on the people
- The objectives may change, this is in the nature of research

- You should know the direction of your research after your first year
What is research: Thinking critically

- There is a vast body of literature.
- Between 50% and 90% of written material is wrong (me guessing!)
  - Methods can be wrong
  - Objective can be wrong
  - Results can be non reproducible, or work on just one sample
  - Assumptions can be wrong
- You have to separate the parts of papers that are good from the rubbish parts
  - Don’t relying on others; question everything that you don’t understand.
  - When presenting related work, digest what other people say before presenting it
- Independent of the discipline.
What is research: methods

- Research depends on using rigorous methods, precise method depends on the discipline
  - Methods of proof
  - Methods of experimentation
  - Methods of evaluation
  (– Methods are different from the process of discovering a novelty!)
- Methods should be reproducible
- Methods should make assumptions explicit

- The method is something you come up with early on, and includes a way to convince people that your hypothesis holds.
- Only use other people’s methods if you are convinced that they are right. See “Critical Thinking”.
Role of your adviser

• It is all in the name: they advise.
• Good advise is priceless.

• Make sure you have a good relationship with your adviser.
  – If you feel that communication is sub-optimal: talk about it (your adviser, or me, or other people)

• Make the most out of meetings with your adviser
  – Write complex ideas down (is required anyway)
  – Make an appointment (regular or on demand via e-mail) to get his/her full attention
  – Make an agenda if lots of issues need to be discussed (mail it to your adviser in advance)
Role of research output
Research is all about output

- Publications (journals, conferences)
- Presentations (at conferences, other universities)
- IP (patents, spin-off?)
- Free software
- PhD thesis

Adviser will be able to tell you which conferences and/or journals to target

- Each area has its own “league-table”

We expect you to publish

- Maybe in local workshops
- Maybe in international conferences or journals
Role of seminars (departmental seminars, conferences)

You will have to be able to give presentations.

- Research groups will often have meetings where you present ideas, papers
- Presentations at conferences and workshops
- Preparation for post-PhD life where you will present left, right and centre.
- Departmental seminar (weekly term-time)
- PhD reviews (weekly, Monday 13:00)

Also,

- Listen to other people’s presentations: don’t become too focused on your own area, there is more to Computer Science than just that.
Where to look for papers

In addition to your own ideas, you will have to look up what other people do (have done)

- Library
  - Journals and proceedings are upstairs
  - If there are missing books, tell your adviser. (We have a book budget.)
  - Inter-library loan vouchers allow you to request books from other libraries.

- http://www.citeseer.com/
  - Check citations

- http://www.google.com/
  - Check anything
PhD reviews

In addition to meetings with your adviser, there is a formal PhD review twice a year.

- the “bad” news
  - you need to think about what you have achieved
  - you need to think about what you are planning to do
- the “good” news
  - you will either hear that everything is going well, or you will be told what needs to change.

You must submit a report

- Bullet points with achievements and plans
- Scientific contents (see handbook for guidance)
PhD review – first year

After first year you must submit a thorough report that shows
  • that you understand the field
  • that you know where you are going
  • that you can write clearly and critically.

Guideline:
  • around 10,000 words
  • length and contents depend on discipline
Financial issues

If you want more money, you can become a lab demonstrator or teaching assistant

- Gives you an insight into teaching
- Good for CV
- Pays better than Sainsbury’s and it is related to your work.

Conferences / workshops

- Discuss the funding with your adviser when you submit a paper / get one accepted;
- there is almost always funding available (for travel, subsistence and conference fees) to present a paper at a credible conference.
Research ethics

Very few people do research on their own
• May involve colleagues, peers, advisers, outsiders, etc etc.

Input from (to) others can vary
• Idea, implementation, discussion, advise, financial support, paper writing, paper reading ...

Make sure you acknowledge contributions properly
• May involve a \thanks{} on the title page, a statement in the acknowledgement section, or making someone a co-author.
• If unsure, talk to the people involved, or your adviser, or others.
Social events

- Senior common room (3.01)
  - lunch, coffee, tea (11, 1, 3).
  - Donuts on occasions (birthdays, other memorable events, feel free to provide them, but please announce on cs-donuts)
- Quite a few groups disappear to pubs on various evenings
  - Feel free to join or start a new group
- Other people play squash, run, climb, ...