

OXFORD UNIVERSITY COMPUTING LABORATORY

D.Phil. Research in the Oxford University Computing Laboratory

Students embark on a Ph.D. for a variety of reasons but are often unaware of exactly what it is they are letting themselves in for. This brief article aims to prepare you. Much greater detail on matters not specific to topics studied in the Oxford University Computing Laboratory can be found in reference [1].

First it is worth summarising how a Ph.D. is perceived in the community at large. The qualification acknowledges that you, its possessor:

- are a recognised professional in your subject, to which you have made original contributions at the international level,
- appreciate the criteria by which contributions to your discipline are judged (and in particular the value of your own work),
- are proficient in certain techniques and are aware of their strengths and weaknesses,
- can communicate your results effectively.

Such substantial goals are not effortlessly attained. To achieve them over a three-year period requires the acquisition of not only technical skills (the one thing which all prospective Ph.D. students do appreciate) but just as importantly:

- the ability to be self-motivated and to work much more under your own management than you did as an undergraduate,
- assuming responsibility for evaluating contending targets, achieving them, and for the validity of the consequent results,
- being mature enough to endure swings between satisfaction and frustration that can be much greater than they were at the undergraduate level,
- making effective use of relevant resources, including seminars, libraries, conferences, networks and local expertise,
- time management, including the ability to meet deadlines,
- developing a good working relationship with your supervisor.

Few would attain that impressive but intimidating list of skills were it not for the solid support of their supervisor and, to a lesser degree, their contemporaries. Through them you will gain support in all those directions and receive guidance about the required standard in each case.

Some students arrive in Oxford knowing precisely what their research topic will be; others have little more idea than of its general area. Someone once described

research as 'Finding out something to find out, then finding it out'; the first part is often harder than the second part! Consequently some students focus rapidly on their thesis work whilst others spend much of the first year putting themselves in a position to be able to do so. But it is important for all research students—even those who know precisely what their field of research is going to be—to acquaint themselves with as much as possible of the work going on in the Department. There are many points in common between research fields and many useful ideas can be borrowed from fields other than your own. Understanding other areas in depth usually helps to appreciate features of one's own area. The Department's various seminar series and advanced courses are held partly for that purpose.

What characterises research in the Computing Laboratory at Oxford? It is based on the intelligent gathering of evidence in the disciplines of Computer Science or Numerical Analysis, achieved by asking and answering questions. That activity normally results in a novel and productive view being taken that supports a number of new results whose importance can be demonstrated in the computing or numerical systems whose study led to their discovery. There is usually a theoretical component that endures beyond the examples considered, and a practical component, important because it justifies and inspires study of the theory.

Research thus does not consist merely of completion of a program, even a complex one—a view favoured by amateur programmers! Nor does it consist of the discovery of a piece of unapplied mathematics. The blend of theory and practice expressed so clearly in our Departmental statement is fundamental to our view of research. It is one we wish, above all else, to convey to our students.

Reference

1. *How to Get a PhD: A Handbook for Students and their Supervisors*. Second edition. E M Phillips and D S Pugh. Oxford University Press, 1994.