SGR Induction and Research Culture

Research Culture of the Microplatform Research Group:
Important aspects of Supervision & Publication

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Overview

- Introduction to the Microplatform group
  - The whole team
  - Sub-groups
  - Individual Student Projects (and supervisory arrangements)

- Our strategy to pursuing a PhD
  - Year 1: Prescribed
  - Year 2: Explore
  - Year 3: Consolidate

- Importance of Publication (1 PhD = 4 papers)
The Microplatforms Research Group (MRG)

- The MRG evolved from my own research projects and interests/funded projects

- Currently 56 people (!), including
  - 4 Academic staff
  - 10 Research Fellows
    (5 competitive ARC Fellows, DECRA, APD)
  - >30 PhD students
    (I am first supervisor of about 11 PhDs)
  - About 5-10 research assistants/interns/honours ...

- Such a big group needs some structure ...
  (how do we stop PhD students getting ‘lost’?)
Previous Approach (pre 2009)

- One-on-one Student Supervision
  - Senior supervisor driven
  - Limited roles for ECRs
  - Fairly egalitarian: a team of peers
  - Large number of students = large number of meetings! (Exhausting!)

- What happens if a large number of students want to work in one research area?

- What if a number of researchers in the area are early career researchers?
New Group Structure (post 2009)

- The team defined ourselves (and defined our research foci)

- Microplatforms Research Group Teams
  - Integrated optics
  - Lab-on-a-chip
  - Functional materials and microsystems
  - Nanotechnology enabled devices and sensors
  - Microplatforms for radio frequency applications

- Microelectronics & Materials Technology Centre
  - Affiliated enabling facility but distinct culture
Composition of a sub group
(eg: Integrated Optics Group)

- Group Leader: An ECR researcher
- MRG Director (Me)
- 1-2 post-doctoral fellows who are involved
- 3-5 PhD students
- 2-3 Honours students
- 1-2 Visiting researchers/interns
- Total: About 10 people.
Sub-Group Definition

- Each Sub-group has:
  - A mission statement (defined by the original group)
  - Several funded projects (providing support and direction)
  - A physical laboratory (managed by ECR team leader)

- New projects are aligned
  - New funded projects align to mission
  - New PhD projects align to existing projects

- Prevent PhD being ‘out on their own’

- Ensure PhDs are at the ‘frontier’ (can publish)
Modified Supervision Approach

- Weekly sub-group meetings
  - 2 hours per week for each sub-group
    - Equates to about 10-12 hours per week for Director (me)
  - Involves all students in that sub-group
  - Supervisory team group leader and ECRs
  - Senior supervisor provides direction
  - ECR provides daily point of contact, ‘hands on’ support
  - Ensures a more interactive exchange of ideas
    - Team members with different levels of experience
    - New research questions and solutions
Modified Supervision Approach

- Weekly sub-group meetings has negatives
  - Student may feel lack of personalised attention
  - Hesitancy to ask questions in presence of a group
  - Many others ... (it is not perfect!)

- Additional one-on-one meetings
  - Tackle negatives encourage separate one-off meetings (but must have defined outcome)
  - Modified supervisory approach allows time for this
  - Such meetings also required when defining new projects and finalising publications
PhD Project Strategy
Year 1: Confirmation of Candidature

- Define the Project:
  - Use Confirmation of Candidature form as a guide
  - Identify 4 research questions
    - Each question should be general, but deep (an answer should constitute at publication)
  - Identify the ‘frontier’ for each research question
    - What key recent research paper relates to each question? (your literature survey is not a tutorial!)
    - What small step will take you beyond the frontier? (this is a proposal for research leading to a paper)
  - At the end of Year 1, you should present your CoC (will likely include material from your 1st Paper)
In Year 1 the supervisors prescribe the first paper for a PhD

• This will give you
  – Practice in actually doing research
  – Familiarity with the tools you will need
  – Understanding of how to write a paper
  – Understanding of how to publish paper

• Your first paper should, to some extent answer your first research question
  – This will give you insight into how your research questions turn into papers

• Year 1 is led by the supervisor team
Year 2: Explore ...

- Year 2: demonstrate independence (This is your project)

- Go exploring
  - Pursue your other research questions
  - Follow your own path ...
  - Get ‘lost’ in the wilderness ...

- Supervisory team provides broad guidance (but is not prescriptive ... )
At the end of Year 2

- End of year 2, you should have
  - Partial answers to research questions 2 and 3
  - Material for 1 or 2 more papers
  - New appreciation for what your project is really about

- You could be quite lost at this stage though ...
Year 3: Consolidation

- Year 3, the supervisory team returns
  - Ensure that at least 3 of the research questions have some sort of answer
  - Help finalise the partial papers
  - If lost in the woods ... help find the way home

- In Year 3, the thesis should also be prepared ...
Year 3: Consolidation

Preparing your thesis:
(1 Thesis = 3 or 4 Journal articles)
- If you have published 3-4 papers, there is no question that you have made a contribution to your field (assessor does not need to assess worthiness)
- very easy to turn a journal article into a thesis chapter (much harder to turn a chapter into an article)

publication is not optional!

Never say: ‘I don’t have time to write a paper, I have to get on with writing my thesis ...’ (they are the same thing!)
Conclusions/Summary

- Ensure your work is really at the frontier ahead of time
  - Ensure your supervisors are publishing at the frontier
- Publish early, publish often!
  - Ensure one paper comes out early (in close collaboration with your supervisors)
- Go exploring in year 2 ...
- Your thesis = a few papers
  - Make your life easy
  - Make your examiners job easy
- Note: Nothing goes according to plan ...
  (but your supervisors are there to help)