

Research Tools and Methods for the Mathematical Science

Lecture 1: Tea Room Etiquette

Matthew Roughan

`<matthew.roughan@adelaide.edu.au>`

[http://www.maths.adelaide.edu.au/matthew.roughan/
Lecture_notes/ResearchToolsCourse/](http://www.maths.adelaide.edu.au/matthew.roughan/Lecture_notes/ResearchToolsCourse/)

School of Mathematical Sciences,
University of Adelaide

March 10, 2015

Proof by appeal to intuition: Cloud-shaped drawings frequently help here.

Tea Room?

- This lecture is really about interacting
- The tea room is one of those places where you do it
- Etiquette is about how to do it, without pissing people off
 - ▶ underlying it all is the golden rule “do unto others as ...”

Why interact?

Research is at least 50% communication, 50% thinking, and 50% more hard work (and yes I know what that adds up to)

- you will be judged by other people (getting jobs, grants, ...)
- work that is never communicated may as well never be done
- modern research is too complex to be done by one person
- you never know who or what will be important for your work

When?

- all the time
- as much as you can

When?

- all the time
- as much as you can
- because I know many of you won't want to
 - ▶ because I don't
 - ▶ because I'm a pathological introvert (I got better)

How?

- email
- going to talks
- conferences and workshops
- publications
- giving talks
- blogs
- writing reviews
- requesting grants
-
-

Who

- your supervisors (or advisors, or mentors)
- other colleagues
- the rest of the world

Mentors

Who are they, and how did you choose them?

- let's take the obvious example: your project supervisors

Your Supervisors

The choice: you may have done it once, but next time...

- More than one is compulsory at Adelaide for PhD and M.Phil
 - ▶ not just a bureaucratic issue
 - ▶ reduce risk
 - ▶ provide multiple viewpoints
- You don't need to stay with the same supervisor through honours, M.Phil and PhD
- Your supervisor will be your intro in to the world of research
 - ▶ you work very closely with them
- Many people will (early in your career) judge you by who your supervisor was
- Selection should be almost like interviewing someone to work for you
 - ▶ should you talk to their current students?
 - ▶ what criteria should you use?

Your Supervisors

Selection criteria

- Good criteria
 - ▶ quality researcher (look at their CV, publications, citations,...)
 - ▶ quality of the institute (ERA rankings, with a pinch of salt).
 - ▶ you get on
 - ▶ energetic and not over-committed (they have time for you)
 - ▶ in an area you are interested in
- Bad (single) criteria
 - ▶ good/bad lecturers aren't necessarily good/bad supervisors
 - ▶ the exact project
 - ★ students are rarely in a position to properly evaluate a project
 - ★ it may well change anyway
 - ▶ race, gender ¹
- Others
 - ▶ location - Adelaide?
 - ▶ money (shows value but)
 - ★ money always has expectations attached (a PhD is a chance to do **your** work. Do you want to be pushed in the direction of your funding?)

¹There was quite a bit of discussion about this particular issue in 2013. My comments were motivated by my opinion and [MM10, pp.11-12].

Your Supervisors

Reasonable expectations of your supervisor

- Meet once a week
 - ▶ ECMS workload model allocates 50 hours/year for supervising a student (shared between supervisors)
 - ▶ doesn't have to be exactly once a week, but on average ...
- They have your best interest in mind
 - ▶ they should avoid conflicts of interest
- They should choose good projects
 - ▶ and help you stay on track
 - ▶ they may need to kick you
- They should provide clear, constructive feedback
 - ▶ that might not be fun for you
- When possible ensure you meet people
 - ▶ other researchers in your area
- Maybe: help get funding for your (official) travel
- Maybe: help you get a job or into your next degree

Your Supervisors

Unreasonable expectations of your supervisor

- They don't teach you everything
 - ▶ provide pointers
- They aren't always your friend
 - ▶ they have to kick you along sometimes
- They don't do your work
 - ▶ they won't write your thesis
- They aren't your nanny
 - ▶ this is **your** project
- They are VERY busy
 - ▶ you aren't 1st, or even probably 10th on their priority list
- They are human

Your Supervisors

Your supervisors' expectations of you (your responsibilities)

- Work hard
 - ▶ lots of academics don't work 9-5
 - ▶ even so 40 hour week should be seen as a **basic** commitment
- You are in charge of your degree
 - ▶ keep track of admin issues, e.g., major reviews
- Do what you are asked to do
 - ▶ make notes
 - ▶ make sure you understand what you are being asked
 - ▶ ask questions
- But be independent [**Azu03**]
 - ▶ do you just do what your supervisor asks?
 - ▶ what do you do if you get stuck?

The difference between people who exercise initiative and those who don't is literally the difference between night and day. I'm not talking about a 25 to 50 percent difference in effectiveness; I'm talking about a 5000-plus percent difference,

Stephen R. Covey

Your Supervisors

Meeting notes

I make it a requirement for my students to make supervisor-meeting notes

- It isn't just a formality – its useful
 - ▶ reminders (for you and supervisor about previous meetings)
 - ▶ helps avoid repetition
 - ▶ reminder (for you) about all your accomplishments
 - ▶ helps avoid repetition
- Format I use:
 - ▶ bullet points, one page
 - ▶ time/date, who was present
 - ▶ bullets of what was discussed
 - ▶ action items (things for you to do this coming week)
- Supervisors should sign off on it each week (just by email)

Your Supervisors

Setting expectations

DISCUSS EXPECTATIONS EARLY ON

- The above is a guide
 - ▶ your mileage may vary
- You need to talk to your supervisor early on to agree on these issues
 - ▶ e.g., authorship

Authorship

If you're co-authoring a paper, most of your notoriety will derive from the order of authors and not from the content of your paper – so make sure to have vehement and petty debates about whose name goes first. Here are the general rules for authorship:

- 1st Weary graduate student who spent hours doing the work.*
- 2nd Resentful graduate student who thinks he or she spent hours doing the work.*
- 3rd Undergraduate just happy to be named.*
- 4th Collaborator no one has ever met whose name is only included for political reasons.*
- 5th Postdoctoral fellow who once made a chance remark on the subject.*
- 6th For some reason, Vladimir Putin.*
- 7th Principal investigator whose grant funded the project but who hasn't stood at a lab bench in decades, except for that one weird photo shoot for some kind of pamphlet, and even then it was obvious that he or she didn't know where to find basic things.*

Adam Ruben, 2012 [Rub]

Authorship

Setting expectations

Authorship is one of the most contentious academic issues.

- Who should be an author
 - ▶ they should have made a **significant** contribution
 - ★ is suggesting an idea “significant”?
 - ★ is managing a project “significant”?
 - ★ is getting funding for the project “significant”?
 - ★ is providing the data “significant”?
 - ▶ they should have been involved in writing the paper (at least they need to have read it and agreed it is correct)
 - ▶ many supervisors don't believe they have an automatic right to be an author on all their students papers, but some do
- What order should the authors appear in.
 - ▶ in maths, the order is sometimes alphabetical
 - ▶ often its intended to imply meaning
 - ★ first author is the one whose name is cited
 - ▶ random (everyone gets a go at being first)

Authorship

My personal philosophy

- Be generous in offering authorship
 - ▶ I have been annoyed if someone left me out of a paper I thought I had contributed to. I don't work with such people twice.
 - ▶ Remember the Golden Rule
- Be conservative in accepting authorship
 - ▶ don't do it just because its offered.
 - ★ did you really contribute?
 - ★ do you have time to help write it?
 - ★ is the paper good?
- Give plenty of acknowledgments [Rot97] – it will rarely hurt, but often help
 - ▶ cite well, and often
 - ▶ ack funding bodies

Your Supervisors

University policies

- General comments:
<http://www.adelaide.edu.au/graduatecentre/handbook/05-candidature/03-supervision/>
- Responsibilities:
<http://www.adelaide.edu.au/graduatecentre/handbook/11-appendices/02.html>
- Authorship policy
<http://www.adelaide.edu.au/policies/3503/>
- Grievances, Complaints and Problems During Candidature
<http://www.adelaide.edu.au/graduatecentre/handbook/05-candidature/10-grievances-complaints-problems/>

Your Colleagues

- Your success will depend on being able to work with good people
- Don't piss them off
 - ▶ be easy to work with
 - ▶ don't waste their time
 - ★ be prepared for meetings
 - ★ don't argue about trivial things
 - ▶ give them something they can use
- Don't be parochial or timid
 - ▶ get out there
 - ▶ they want to work with good people just as much as you do
- Don't be selfish (with time or ideas)
 - ▶ give and you shall receive (but not necessarily at the same time)

The Rest of the World

- Other people in your area
- Other scientists
 - ▶ often these people will be judging you
 - ★ getting jobs
 - ★ getting grants
 - ▶ you need to be able to sell your ideas to a smart audience, who don't know your area
- Everyone else: you never know when ...
 - ▶ press
 - ▶ elevator talks

Going to a Conference or Workshop

- Give a talk (if you can possibly)
 - ▶ you are (to other researchers) what you do
- Give a really, really good talk
 - ▶ we'll talk more about this
- Have your “spiel” ready
 - ▶ we'll talk more about this
- Talk to people as much as possible
 - ▶ after their talk, thank them, and ask more questions
 - ▶ lunch and dinners are often a chance to sit with someone random
 - ★ don't always sit with just your friends

Going to a Conference or Workshop

School policy for travel support

- Funded attendance at key academic societies meetings
 - ▶ Australian Statistical Conference
 - ▶ Annual AustMS meeting
 - ▶ ANZIAM Conferenceonce per year for all HDR students (in good standing).
- Postgraduate International Travel Award
 - ▶ support for attendance at an International meeting
 - ▶ only PhD students (in good standing)
 - ▶ must be giving a talk
- Awards pay (cheap) airfare, accommodation, registration.
- Must apply (and also apply for alternative sources).

Going to a Seminar

There's lots of information about giving a seminar, but we often blob up for a talk, and sit there like we are idiots.

What I (try to) do

- Write notes
 - ▶ I concentrate and remember better when I take notes
 - ▶ sometimes I throw them away immediately (the notes aren't the point)
- Ask questions (really!)
 - ▶ the speaker will most likely be pleased!
 - ▶ if you don't, then the presenter will assume
 - ★ you weren't listening
 - ★ you're stupid
 - ★ both
- Thank the speaker in person afterwards
 - ▶ tell them what you liked about the talk

Meetings

attending a meeting

- Try to find out why the meeting is being held, and whether you really should be there
- Take notes
- Speak up rarely, but do talk when needed
- Make your point and move on
- Don't complain
- Compromise
- Targeted volunteering

[http://adequateman.deadspin.com/
how-to-survive-an-office-meeting-a-guide-for-sad-drone-167920](http://adequateman.deadspin.com/how-to-survive-an-office-meeting-a-guide-for-sad-drone-167920)

Meetings

running a good meeting

- Organise time and space early
- Choose people well (small numbers are better)
- Have a clear goal for the meeting and make sure people know it
- Keep on track, and on time
- Make decisions, but as fairly as possible
- Give people things to do
- Followup

[http:](http://www.forbes.com/sites/forbesleadershipforum/2014/02/05/seven-steps-to-running-the-most-effective-meeting-possible/)

[//www.forbes.com/sites/forbesleadershipforum/2014/02/05/seven-steps-to-running-the-most-effective-meeting-possible/](http://www.forbes.com/sites/forbesleadershipforum/2014/02/05/seven-steps-to-running-the-most-effective-meeting-possible/)
<http://www.mindtools.com/CommSkll/RunningMeetings.htm>

Other Links

- Sources of good advice
- How to Be a Good Graduate Student

Summary

- Interaction is GOOD
- Play nice
- Set expectations early
- Take responsibility for your work

Assignment

Send me your report from your supervisor meeting this week.

- Let your supervisors suggest how it should be
- Let them know you are sending it to me
- Send by email with “RM: supervisor report” in the subject
- Due before the lecture next week

Further reading I



Ronald T. Azuma, "*So long, and thanks for the Ph.D.!*" a.k.a. "*Everything I wanted to know about C.S. graduate school at the beginning but didn't learn until later.*", 2003, <http://www.cs.unc.edu/~azuma/hitch4.html>.



Mor Harchol-Balter, *Applying to Ph.D. programs in computer science*, <http://www.cs.cmu.edu/~harchol/>, 2011.



Hugh Kearns and Maria Gardiner, *The seven secrets of highly successful research students*, Thinkwell, 2012.



L.L. McCabe and E.R.B. McCabe, *How to succeed in academics*, University of California Press, 2010, Good points about many aspects, but oriented towards the health sciences, so must be read critically.



Gian-Carlo Rota, *Ten lessons I wish I had been taught*, Notices of the AMS **44** (1997), no. 1, 22–25, <http://alumni.media.mit.edu/~cahn/life/gian-carlo-rota-10-lessons.html>.

Further reading II



Adam Ruben, *How to write like a scientist*,

http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2012_03_23/caredit.a1200033, Amusing satire on common flaws in scientific writing.