Strategy and tactics in research

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1. Why this talk?
2. Why am I allowed to talk about these things?
3. The objective function.
4. What does it take?
5. Strategies.
6. Tactics.
7. Conclusion.
1 Why this talk

- We are used to do things because we’ve always done them, or because that’s what were paid for or…
- In any job there is something called career management. Why not here?
- If you are not told these things you only find out… usually when it’s too late.
2 Why me?

- Not because I have had such a successful career.
- That would probably not make me a good speaker about the subject.
- Because I have made a lot of mistakes.
- Because I have seen a lot of mistakes.
- Because I have read some things.
- Because I have to teach the subject!
3 The objective function

- Why should we worry about these things?
- What is our ultimate goal?
- Why is it important to have such a function:
  - Research is not like football or singing: the pay-off is very far away;
  - Just going for very short term gains is not a good idea.
Some possible objective functions (1)

• Getting a position
• Getting my next sexenio
• Getting my habilitacion
• Getting more money

• Not long term concerns, just short term.
• They should be regarded as intermediate rewards, not as goals achieved.
Some possible objective functions (2)

• Earning more and more money?

• You don’t usually do this for money. There are easier ways.
Some possible objective functions (3)

- To be happy?

- That is (supposed to be) everyone’s goal, but then everyone is happy for different reasons.

- And at different moments of one’s life/career the reasons will change.
Some possible objective functions (4)

• To have an easy comfortable life: earn a decent living, not have to do many hours, have a lot of holidays, no responsibilities, no stress, not have to move to another city, be sure to keep your job all your life…

• You probably would not be listening to me…
Some possible objective functions (5)

- To be an important person?

- Easier tracks exist: take the right responsibilities, go to meetings, join a political party,…
To be “big” in research

• Why should this be an interesting goal?
• Meet interesting people
• Discuss interesting questions
• Have the feeling that you are a step ahead
• Also ambition, egocentrism, desire for power, money, free travel, …
Can this be a dream or a goal?

• It is quite normal to believe that those guys at the top are so much more brilliant than you are.
• But it doesn’t pay off.
• What does is to be ambitious.
Why?

- Some of the actions we take today have a very long term pay-off.
- If we don’t consider our career in 10 years time, there are things we will “leave for later”.
- Always.
4 What does it take?

1. Intelligence and hard work.
2. A good subject, a good team, good influential people to push, collaborators who want to work with you, funding, contacts, …

The talk is about the second point. But without the first the second is pointless.
A good subject

• Related questions:
  – How do I decide a problem is worth looking at?
  – How do I make sure people in my community read my work?
  – How do I make a name of myself in this community?
A good team

• 2 issues here:
  – Getting a good team to hire you
  – Making your team a good team

• In both cases the quality of your network is going to play a key part.
Good influential people to push

• It does matter;
• You will pay a penalty if you ignore this;
• Essential to understand that being a good researcher is not enough.
• Don’t wait until you need this type of help to look for it!
Collaborators who want to work with you

• Question is not “why would I want to work with him?” but “why would he want to work with me?”

• Because it’s interesting to work with me. So let’s make it interesting!
Funding

- Funding goes to those that have shown that they could produce something out of this funding.
- Reputation is more important than the ideas.
- If in doubt read “advices to reviewers”
5 Strategy

We want to be part of the community. Because:

• We get access to the information
• We get to work with the top people
• It’s good for our career
Some strategy lines

1. Have a good subject
2. Have a sound policy of publication
3. Build your network
5.1 The subject

- There are different fields with different rules
- Some accept the young
- Some protect the old
- Choose with care and change subject if you are getting nowhere
Go for the hard questions

• It is easier to publish partial results to hard problems than solutions to easy ones.
• On hard questions more people share the problems.
5.2 The publications

• Where should I publish?
  – Big conferences for the prestige
  – Small workshops because that is where you meet people
  – Journals because that is what stays
  – International events because that matters
  – National events because there are the people that will hire you, fund you, promote you.
Why publish?

• To be visible.
• Therefore some rules count:
  – Repeat your message
  – Choose with care your conferences
  – Go back
  – Belong to a community (if it’s a good one)
  – Acknowledge
5.3 The networking

- Networking is about building your network.
- This is not a side effect to research. This is a research activity.
- Again, networking should not replace good research.
The snowball effect

• If you introduce yourself to one person, he will introduce you to 2.
• If someone quotes your work, that will give you extra citations.
• If someone uses your algorithm, two other people will.
What qualities do we need?

• Ser simpatico
• Tener buena reputacion
• Ser de trato agradable
• Speak languages
And if we don’t have these qualities?

• Then work on them. They are not something you are born with.
• You build them and make an effort.
6 Tactics

• Tactics is about how we get to the small intermediate goals we have set ourselves, but also about those things we do for a later payoff.
Networking

• This is a specific activity. There are rules and tricks.
• You should aim at filling in your address book.
Helping out

• Basically, if asked to help, you should accept.
• If you are not asked you should volunteer
• Can someone rely on you?
Learn English

• Spend as much time on this task as possible.
• Ideally you want to be fluent.
• If the fact these slides were in English bothered you, then you should spend more time on your English.
Writing papers

• Choose:
  – The journal or the conference
  – The authors
  – The title
  – The reference list
  – The acknowledgement
  – …
Conclusion

• Think about a long term goal.
• Then work according to this goal.
Appendix.

How to Be a Good Graduate Student

• by Marie desJardins

http://www.physlink.com/Education/grad_how2_community.cfm
One of the most important things a graduate students should do is to become established as part of the research community. Your advisor can help with this process by funding conference travel, encouraging you to publish research results early, collaborating on joint publications, introducing you to colleagues, and promoting your work.
• In turn, you can make yourself more visible by participating in conferences and workshops, publishing papers on your work, and meeting and maintaining contact with colleagues.
Attending Conferences

• Attending conferences and workshops is valuable whether you present a paper or not. Some of the reasons to do so are:

  – You'll meet people and have a chance to discuss your ideas and to hear theirs.

  – You'll get a good sense of what the current state of research is, and will learn more about how to write conference papers and give talks (sometimes by counterexample).

  – You'll probably realize that your ideas are more significant, relatively speaking, than you thought. A common reaction is ``I could write a better paper than this!"
• If you're giving a talk you'll gain even more visibility, and will have an opportunity to make an impression on other researchers. Some tips for preparing your talk to make this impression as positive as possible:

  – Give a practice talk, especially if you tend to get stage fright. Be sure to invite people who will give you constructive, but useful, feedback.

  – Make sure your talk fits in the time slot allocated. There's nothing worse than a speaker who rushes through the last ten slides, or skips from the middle of the talk to the conclusion. A good rough rule is to allocate 2-3 minutes per slide, on average.
• It's better to be somewhat abstract than to get bogged down in technical details -- but be sure you give enough detail to make a convincing case. Your paper should fill in the missing details, so that people can read it to get a more in-depth understanding. **Know your audience:** you'll have to give more background to a general audience, and more technical detail to audiences that are very familiar with the field of research you're discussing.

• **Use examples and pictures to illustrate and clarify your ideas.**
• Learn by observation: try to imitate qualities of talks that you like, and avoid things that other speakers do that bother you.

• Talk about your ideas informally whenever you get the chance, so that the talk will come more naturally and, hopefully, you'll have a chance to respond to and think about questions that might get asked at the talk.
• Make sure your slides are readable and as simple as possible. Never put up a slide with tiny text and say "I know you can't read this, but..."

• Try to relax. Don't read from a script or word-for-word from your slides, and don't talk too fast. Be confident: you know more about your work (flaws and all) than anyone else.
Publishing Papers

• Publishing your ideas is important for several reasons: it gives you a source of feedback from people who read your papers; it establishes you as a member of the research community (useful for getting a job down the line); and it forces you to clarify your ideas and to fit them in the context of the current state of research in your field.
• There are two key properties of a good paper: **significant content** -- original, important ideas that are well developed and tested -- and **good writing style**. The degree to which the paper's content has to be `significant" depends on where you're submitting it. Preliminary ideas and work in progress are more suitable for a workshop or symposium; well developed, extensively tested ideas are more appropriate for a journal. One way to decide where your paper should be submitted is to read papers in potentially appropriate publications (last year's conference proceedings; current journal issues). Another method to show a draft or outline of the paper to your advisor or other colleagues and ask their advice.
• if you have a great idea, but present it poorly, your paper probably won't be accepted. Be sure you know what the point of the paper is, and state it clearly and repeatedly. The same goes for the key technical ideas. Don't make the reader work to figure out what's important -- tell them explicitly. Otherwise, they might get it wrong, if they bother to finish reading the paper at all. State the problem you're addressing, why it's important, how you're solving it, what results you have, how other researchers have addressed the same or similar problems, and why your method is different or better.
• Write for the audience that you expect to read the paper, just as you would plan a talk. Give more background for general audiences, less background and more technical detail for specialized audiences. Use a running example if possible, especially if your paper is dense with equations and algorithms.

• Don't try to put every idea in your thesis into one conference paper. Break it down into pieces, or write one or two longer journal articles.
• As you refine your ideas, you can republish in new forms, but be sure you're adding new material, not just rehashing the same ideas. Some papers start as short workshop papers, evolve into conference papers, and eventually -- with the addition of detailed empirical results or formal proofs -- become journal articles. It's usually okay to publish the same or substantially similar papers in multiple workshops, but papers for conferences and journals generally have to be original, unpublished work.
• It is critical that any paper you plan to submit be read by someone else first, if only to check for typos, grammatical errors, and style. A good reviewer will give you feedback on the organization and content of the paper as well (see the section on feedback). The more tightly refereed the publication you're submitting to, the more trouble you should go to have it pre-reviewed. For a workshop paper, having your advisor read it over is probably enough. For a refereed conference, have one or two other graduate students read it as well. For a journal paper, you should probably find researchers who are active in the field, preferably at other institutions (to give breadth), read it over and give you comments. This is where the network of colleagues you should build (see the section on networking) comes in handy.
• If your paper is rejected, keep trying! Take the reviews to heart and try to rewrite the paper, addressing the reviewer's comments. You'll get more substantial and useful reviews from journals than conferences or workshops. Often a journal paper will be returned for revisions; usually a conference paper will just be accepted or rejected outright. After reading the review the first time, put it aside. Come back to it later, reading the paper closely to decide whether the criticisms were valid and how you can address them. You will often find that reviewers make criticisms that are off-target because they misinterpreted some aspect of your paper. If so, don't let it get to you -- just rewrite that part of your paper more clearly so that the same misunderstanding won't happen again. It's frustrating to have a paper rejected because of a misunderstanding, but at least it's something you can fix. On the other hand, criticisms of the content of the paper may require more substantial revisions -- rethinking your ideas, running more tests, or redoing an analysis.
Networking

• One of the most important skills you should be learning in graduate school is how to `network.' Breaking into the research community requires attending conferences, meeting established researchers, and making yourself known. Networking *is* a learned skill, so you shouldn't expect to be an expert at it immediately; but it is also a skill that you can, and should, learn in order to be a successful member of the research community.
• Just going to conferences and standing in the corner isn't enough. Especially if you're not normally an outgoing person, you have to make a conscious effort to meet and build relationships with other researchers. Presenting papers is a good way to do this, since people will often approach you to discuss your presentation. Introducing yourself to people whose presentations you found interesting, and asking a relevant question or describing related research you're doing, is also a good way to meet people.
• You should talk about your research interests every chance you get. (But be sure to spend some time listening, too: you'll learn more this way, and people will feel that your conversations are a two-way street.) Have summaries of your work of various lengths and levels of detail mentally prepared, so that you can answer the inevitable "So what are you working on?" intelligently and clearly. If someone expresses an interest in your work, follow up! Send them e-mail talking about new ideas or asking questions; send them drafts of papers; ask them for drafts of their papers and send them comments. (If you do this, they'll be sure to remember you!) Bring business cards with your e-mail address to conferences to help new acquaintances jog their memory.
• Maintain the relationships you form via e-mail, and by re-establishing contact at each workshop or conference you attend. If you work at it, and use your initial acquaintances to meet new people, you'll find that your "network" grows rapidly.
• Sometimes these contacts will grow into opportunities to do collaborative research. Seize these opportunities: you will meet more people, often become exposed to new methods of doing research or new subfields within your research area, and the responsibility you feel towards your collaborator may give you more of an incentive to stay motivated and keep accomplishing something.
• Other professional activities can bring you into the research network as well: volunteer for program committees, send your resume to a book review editor, offer to give seminars at other universities, write conference and workshop papers and send them to people you've met or would like to meet, or organize a workshop on your subfield at a larger conference. Mentoring junior graduate students and undergraduates is a good investment in the long run (besides providing them a valuable service and making you feel useful and knowledgeable).
• Finding specific mentors can be very useful. Especially if you feel that you are isolated at your institution, having a colleague at another institution who can give you advice, feedback on drafts of papers, and suggestions for research directions can be extremely valuable.