
How to write a good research proposal

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Bad news

- > For any researcher obtaining independent funding from public and private funding agencies is a MUST!
- > Even more so in the foreseeable future!
- > The competition is getting tougher in terms of the number of competitors and the amount of available funding!

Good news

- › The general standard of research proposals is low, so it is not hard to shine
- › Even a strong proposal is in a lottery, but a weak one is certainly dead
- › And with a modest effort, learning generally how to improve the standard of your proposals, you are at least in lottery!

Background

You can find numerous information on the web related to “how to write a good grant proposal”.

These slides have been heavily inspired (including some cutting and pasting) by the home page of *Simon Peyton-Jones*, Microsoft Research, where you can also find lots of other useful related information:

research.microsoft.com/en-us/people/simonpj

Background

These slides have been also been inspired (including some cutting and pasting) by related info from *Michael Schwartzbach* and *Ole Lehrmann Madsen*, which can be found on our CS web pages

cs.staff.au.dk/boards-and-committees/research-committee/research-application

- › How to write a good grant proposal (document - MN)
- › Vejledning i forbindelse med forskningsprojekter (document - MIS, OLM)
- › Grant evaluations – observations and advice (slides - MIS)
- › How to get a permanent position in academia (slides - MIS)
- › How to write a good research proposal (these slides - MN)

Next few hours

1. Choosing your funding agency
2. Writing your proposal
 - › The Project
 - › The Principal Investigator
3. The interview
4. The review

5. A case

6. Procedures at CS

Choosing your funding agency

Make sure that your *case for support* matches the priorities of the agency!

- > *Pure-, strategic-, applied research, development*
- > *Blue sky versus close to market*
- > *Science versus innovation*
- > *Bottom-up versus top-down*
- > *Discipline- oriented versus thematic-oriented*
- > *Ideas versus cooperation*
- > *Project versus centre*
- > *The man versus the ball*
- > *Disciplinary versus interdisciplinary*

Choosing your funding agency

Important piece of advice: make use of

researchfunding.net

exclusively available to researchers at Aarhus University

Two general observations

- > With luck, your proposal will be read carefully by one or two experts
- > But it will certainly be read superficially by non-experts - and THEY will be most often be the panel members. You have as few minutes of their time to catch their attention

Criteria for grant proposal: the project

The problem

- > *well-defined, relevance,...?*

The idea

- > *state of the art, originality, clear hypothesis.....?*

The methodology

- > *how, workplan....?*

The results

- > *success criteria, deliverables...?*



The PROBLEM

- > Is it interesting (i.e. is it research)?
- > Is it important (who are the “customers”)?
- > Bad phrase
 - *As we all know, we need to understand the Analgesic and Anti-Inflammatory Activities of Salicylaldehyde 2-Chlorobenzoyl Hydrazone (H₂LASSBio-466) and Their Zinc(II) Complexes*
- > Good phrase
 - > *The emerging ubiquitous computing needs alternatives to traditional security mechanisms (passwords, keys, certificates, etc.), since.....*

The IDEA

- > Is it original and novel in addressing the problem?
- > What is the hypothesis?
- > Bad phrases
 - > *We aim to gain insight into..*
 - > *We shall continue to study..*
- > Good phrase
 - > *We propose trust based technology as a novel security mechanism in ubiquitous computing, and our hypothesis is...*

The METHODOLOGY

- > Do you have a plan for achieving your goals?
- > What is in place and what is needed in order to carry out your plan?

- > Bad phrases
 - > *We shall bring together a number of researchers...*
 - > *We shall write a number of papers...*

- > Good phrase
 - > *We shall develop a model for trust, and a prototype implementation testing our hypothesis...*

The RESULTS

- > What are the *success* criteria?
- > What are the *risks*?

- > Bad phrases
 - > *We hope to provide some insight into....*
 - > *We shall improve our understanding of...*

- > Good phrase
 - > *The criteria for success will be a demonstration of a 15% increase of... relative to*

Evaluating an Application: CV

- > publications
- > citations (Google Scholar Profile, Research Gate,...)
- > grants
- > awards (societies, best papers,...)
- > leadership
- > teaching
- > training and training
- > industry (collaboration, experience,...)
- > internationalisation (collaboration, mobility,...)
- > academic services (editorial boards, pc's,...)



See: *"How to Get a Permanent Position in Academia"*

Criteria for grant proposal: YOU

- > Highlight ALL your strong points *relative to the project!*
- > Be BOLD rather than modest!

- > Bad phrase
 - > *Please check my cv...*
- > Good phrases
 - > *As evidenced by... I am recognized for my contribution to...*
 - > *I have acquired unique experience in... from my stay at Harvard*

...but don't overdo it 😊

> Bad proposal

- > I am a world famous researcher with lots of papers and PhD students
- > Please give me the money!

Useful checklist for a grant proposal

- > Title
- > Summary or abstract
- > The problem
 - > relevance, impact,...
- > The idea
 - > originality, novelty,...
- > The methodology
 - > approach, workplan,...
- > Success criteria
- > Risks
- > The principal investigator
- > The team
- > Collaboration
- > Training of young researchers
- > Dissemination
- > Budget

The summary or abstract

- › This is the most important part of your proposal!
- › It will be read by (almost) all panel members and reviewers
- › Make sure it contains succinctly all your strong points
 - every word is precious
- › Advice: write it at the very end of the proces.

The budget

- › Make sure that the money you ask for is argued well from the project
- › Make sure that the money you ask for fits the guidelines of the funding agency
- › Make sure that it fits the guidelines of your university

Checklist for budget

- > (parts of) your own salary
- > salaries and other expenses for senior and junior researchers
- > salaries and other expenses for PhD students

- > short-term visitors
- > traveling
- > equipment

- > technical and administrative support
- > overhead

SEEK HELP!

Two golden rules

- > Seek help from collaborators, colleagues, friends etc. reading your proposal again and again. Make sure that they understand completely your case for support - and that they are convinced 😊!

- > Make sure that the first page contains THE case for support! When in doubt – simplify!

The interview

- > The presentation:
 - > Know and address your audience appropriately
 - > Don't say everything – simplify
 - > Write a comic strip of your talk before your talk
 - > Be comfortably and appropriately dressed
 - > Don't drink a carbonated beverage before the interview
 - > Your laptop should of course be offline
 - > - and your mobile phone switched off
- > The questions:
 - > Useful advice: always repeat the question

Typical pitfalls - formalities

- Administrative rejection
 - > inappropriate grant instrument
 - > illegal budget
 - > missing signatures or stamps
- Missing attachments
 - > CVs for co-applicants
 - > approval from host institution
 - > project description
- Unconvincing CV
 - > obscure publication list
 - > unclear employment status
- Excessive budget
 - > unjustified expenses
 - > knowledge *can* be too expensive



The review – typical reasons for rejection

- › *It is not clear what question is being addressed by the proposal*
- › *It is not clear why the question is worth addressing*
- › *The proposal is just a routine application of well-known techniques – lacking originality*
- › *The research outlined is incremental*
- › *There is no evidence that the proposers will succeed where others have failed*
- › *The proposers seem unaware of related research*
- › *The proposal is vague with respect to the expected outcome*

Receiving a bad review

From my close observation of writers, they fall into two groups:

- › *those who bleed copiously and visibly at any bad review,*
- › *those who bleed copiously and secretly at any bad review*

Isaac Asimov

Receiving a bad review

- › Forget your ego
- › Leave a bad review for some time before reacting
- › Respond constructively (*thank you for your...*)
- › In general: don't start fighting with your reviewers
- › In special cases: argue your case with the managing director (or the editor, program chair,...)

Final remarks

- › Choose carefully and get familiar with your funding agencies
- › Remember that funding agencies have to argue for their existence – convince them that you may help©
- › Writing research applications is a continuous process – not something to be done just before deadline
- › Seek help and provide help – mutual benefit

Getting back: Ideal proposal

- › Here is an interesting and important **problem** (evidence...)
- › Here is an original and promising **idea** (evidence...)
- › Here is the **methodology** we intend to exploit
- › Here are the **results** we aim to achieve (success, risks)
- › Here is the ideal team for the project (evidence...)
- › Here is what we need in order to succeed (justified)

A case: Evaluation criteria ERC

- › Research project : Ground-breaking nature, ambition and feasibility
 - › Ground-breaking nature and potential impact of the research project
 - › To what extent does the proposed research address important challenges
 - › To what extent are the objectives ambitious and beyond the state of the art (e.g. novel concepts and approaches or development across disciplines?)
 - › To what extent is the proposed research high risk / high gain?
 - › To what extent is the outlined scientific approach feasible?

Procedures at CS

1. Send an email to Ole Lehrmann Madsen – olm
 - > You will then be assigned a mentor from the departmental research committee
 - > Typically NOT from your research area
2. Register your application at services.brics.dk/java/reap
 - > Communication wrt. status, budget, etc. – email notifications
3. Always contact the AU Research Support Unit (FSE)
 - > Advice primarily on formalities
 - > Mandatory for EU applications – to be signed by AU
4. Most proposals need to be signed by Head of Department
 - > Make appointment no later than one week before submission