

# Checklist for effectively writing grants in Stat-ML

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Some personal suggestions (via accumulated wisdom) for assistant professors.

- **Audience.** Grant reviewers are professors, typically more senior than you. No matter how smart these people are, they are not experts in your area. So imagine writing to a colleague of yours in a very different area: you have to have enough background and context for them to appreciate the *importance of your problem*, and enough intuition and detail for them to appreciate the *novelty of your proposed plan of attack*.
- **Sole-PI v Multi-PI.** Pre-tenure, it may be reasonable to try for at least one sole PI grant and one collaborative grant. Sole-PI grants, like the NSF CAREER or a single-PI NSF Small grant, are great ways of expressing a compelling vision in the area of your expertise and convincing someone else that such a direction is worth investment and likely to yield interesting fruit. Multi-PI grants are great ways to foster collaborations with people you'd like to co-advise students with or just work with more on problems where the PIs may have complementary expertise. The latter may provide more money, but requires having a broader vision.
- **Organization.** To make reviewing easy, organize the main part of your grant very well. For example, for a typical 15 page NSF small grant, I might break my broader vision into three main thrusts/aims, with two or three goals/projects per aim. I write down this high level structure at the very start, since it also makes it much easier to write the grant — in one sitting, I only need to write about one page (one goal).
- **Non-technical aspects.** While the core of your grant is certainly your technical content, reviewers take other aspects seriously. For example, writing/visualizing a clear timeline for the deliverables can be useful, as is communicating the synergies between the various thrusts/aims of the grant. Think very carefully about the broader impacts on society, the incorporation of material into teaching, your plan for mentoring students, the impact your solutions may have on other fields or industries, and so on. Thoughtful writing is rewarded.
- **Budget.** Usually, I try to budget one summer month per year of the grant, at least half a student year and half a postdoc year, plus some money for domestic and international travel and purchasing equipment (plus overheads). Postdoc money can be used for students, but sometimes not the other way around.
- **How much time?** Writing grants takes time, no question about it. But it helps organize your vision, forces you to put down vague ideas on paper more formally, and requires you to revisit the literature to make sure you can explain why other solutions are not adequate. I write about one grant per year; the solo ones take me a couple of weeks to write (with a couple of hours per day of writing, but a lot of thinking in between).
- **When to submit?** Work with your department's business manager closely. Tell them as soon as you are even considering submitting a grant (could be weeks or months out) so they can advise you on nuances, and start getting documents in order (and indeed, there are a lot of documents to get in order). The university's office of sponsored projects may require submission to them several days before the actual due date so they can internally review the grant, the budget, any conflicts, any ethical or IRB issues, and so on.
- **Feedback.** The single best thing you can do improve your chances, is to get feedback from a senior colleague before submission (possibly, or even preferably, not in your area). First, this will involve finishing the grant several days or weeks in advance of the deadline — even your own re-reading of it with fresh eyes will catch typos, explanations that can be improved, missing references and improvements to figures. Second, your colleague will be able to tell you which parts went way over their heads and what to add (or remove!) to make a more compelling case. At least do this with the really competitive ones, like NSF CAREER.
- **Smaller awards.** There are smaller awards to apply for (less than 100K USD), like certain faculty research awards from IT or finance companies or fellowships like Sloan. These require less effort to apply for (shorter), but are very competitive and provide less money. If your work aligns with their call, you should apply.
- **Juggling grants.** Receiving (winning?!) a grant is only the first step; now you have to spend the money smartly to get the promised work done. Managing grants (work done and money spent) and periodic reporting (required by all grants), are important steps after getting the grant. Perhaps for another checklist.