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Some Advice for New (and Old?) PhD Students

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Some Advice for New (and Old?) PhD Students

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1. **Write down** all research ideas.
2. **Read** a lot of papers.
3. **Organize** your paper reading.
4. Learn how to deal with **negative reviews** and **rejections**.

1. Write down all research ideas

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A PhD is longer than you realize and your memory is probably worse than you think.

While working on a specific paper, you'll probably get a bunch of ideas for potentially interesting experiments/extensions/applications/etc. These ideas seem obvious there and then, but if you don't write them down they will be very difficult to remember after the paper deadline / 6 months later / 2 years later.

Doesn't have to be overly detailed, just quickly writing a short note is usually enough.

The important thing is to save ideas somewhere where they don't get lost, and where you easily can go back and find them later.

Personally, I use Google Keep and have a label for "Research Ideas" where I create notes/lists, but I'm sure there are a ton of other good tools. Or, just use a Google doc.

2. Read a lot of papers (1/2)

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To me, reading papers is a fundamental part of what it even means to be a researcher. Great way to learn new things. Great way to generate research ideas.

Regularly look for interesting new and old papers:

- arxiv (daily submission postings).
- Twitter (*5 min each day is more than enough...*).
- Accepted papers lists for upcoming and previous conferences.
- Go through the references in interesting papers.
- Go through the "Cited by" list on scholar for interesting papers.
- Create a list of people whose research you find particularly interesting, occasionally check arxiv/scholar for new papers.
- ...

Save seemingly interesting papers somewhere where you easily can go back and find them later (*don't just leave 50 arxiv tabs open in your browser, it can crash...*).

2. Read a lot of papers (2/2)

Actively prioritize reading and set aside some time in your schedule each week (*aiming for at least 1 paper a week has generally worked quite well for me*).

Don't just read the latest state-of-the-art papers within your specific area of interest, try to branch out a little and also read some older papers / papers from other areas.

Join/start a reading group!

- Makes it easier to actually set aside time to read e.g. 1 paper a week.
- Almost always significantly improves your understanding of the read paper.
- Good way to "force" yourself to branch out a little, to read papers you wouldn't necessarily have selected yourself (*such papers can be surprisingly interesting!*).
- Good way to learn about your colleagues' research and interests.
- Also, it's just fun to discusses research/papers with other people.

3. Organize your paper reading (1/2)

Create a note for each paper you read (somewhere where you can easily find it later):

- Write down any questions/thoughts/ideas which arise during reading (*reading papers can generate a lot of research ideas, but again, if you don't write them down you will probably not remember them!*).
- Write a very short summary afterwords (was the paper interesting overall? Was it easy to understand? Could it be relevant for your research now or in the future?).

Annotate the pdf for each paper (and upload it somewhere where you can find it later):

- Get a tablet for reading and annotating papers!
- Annotating the paper makes it easier to stay focused while reading. It "forces" you to actually try to understand what you're reading.
- Annotating the paper enables you to go back to it months/years later and quickly find the most interesting/important information.

3. Organize your paper reading (2/2)

Personally, I also maintain a list of all the read papers, which I share publicly:

- https://github.com/fregu856/papers
- Of course there are much more advanced tools (Zotero?), but this is super simple and seems to provide all the features I need.
- Why share it publicly? Why not? I strongly believe in open science.
- It definitely motivates me to read papers at least (*would be kind of neat to reach 300 papers, and it doesn't hurt to get some more stars on github, I suppose?*).

4. Learn how to deal with negative reviews and rejections (1/3)

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You will receive some negative/unfair/strange reviews. You're almost guaranteed to get a paper rejected at some point. This is just part of life as a PhD student.

First of all, remember that the review process is very noisy:

- The NeurIPS 2021 Consistency Experiment:
- *"In 2014, 49.5% of the papers accepted by the first committee were rejected by the second. This year, this number was 50.6%. We can also look at the probability that a randomly chosen rejected paper would have been accepted if it were re-reviewed. This number was 14.9% this year, compared to 17.5% in 2014"*
- *"More than half of all spotlights recommended by either committee were rejected by the other (13/25 and 13/23)"*
- *"Finally, we would encourage authors to avoid excessive discouragement from rejections as there is a real possibility that the result says more about the review process than the paper"*

4. Learn how to deal with negative reviews and rejections (2/3)

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Getting a paper rejected can still be extremely discouraging though..., but you've just got to try and make the best of it. Address the reviewer comments and resubmit to some other venue. The paper will get a little better with each iteration.

Don't just say "reviewer 2 is stupid" if they seem to be confused by your proposed method or misunderstand your contributions. The method could perhaps be explained a bit more clearly? Your contributions could perhaps be stated more explicitly?

Don't focus too much on getting papers accepted to top conference X, focus on writing papers that **you** are happy with. They will be accepted somewhere eventually. You should always aim high, but don't get too discouraged if the paper gets rejected. Again, **focus on writing good papers** that you are happy with and feel proud of.

4. Learn how to deal with negative reviews and rejections (3/3)

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Finally, papers can get rejected multiple times and still turn out to be relatively impactful / useful for the research community.

My first paper *Evaluating Scalable Bayesian Deep Learning Methods for Robust Computer Vision* got rejected at NeurIPS 2019, and got rejected at AISTATS 2020, before finally being accepted (barely) at a CVPR 2020 workshop. Still, it's by far my most cited paper (cited by 204).

My second paper *Energy-Based Models for Deep Probabilistic Regression* got rejected at ICLR 2020, and got rejected at CVPR 2020, before finally being accepted at ECCV 2020. Still, it's by far my second-most cited paper (cited by 44).

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