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Robotics Research Review (3)

J. Michael Herrmann

University of Edinburgh

RRR: General hints

Use LaTeX (if possible at all):

Start with abstract or summary

Including a ToC does not seem necessary in a 10 page document, but is no problem and will be expected the the thesis

Use 12pt times Time New Roman.

Footnotes/endnotes are actually possible.

Use a spel chacker.

Did I say: Use LaTeX!? Try: LyX, ShareLatex, Overleaf

General points

- Include your name in the reports (and in the filename). Include also affiliation in the report.
- Include an acknowledgement that indicates supervisor and other people who have helped. Prefer plain expressions here.
- Avoid repetitions and redundancies:
“Here we describe experiment and results.”
(especially after a title “experiment and results”)

Good points (from previous years)

- Most of the reports were well-balanced:
 - background – state-of-the-art
 - content – meta-information
 - pictures – text,
- Demonstration of a solid understanding of the subject
- Clarity target reached
- Overall very good style, structure and layout
- Often good argument and story
- Usually a good number of references

Compare

- “... for the same reason as stated in Sect. 3.1.5” vs. “... as we have seen above”
- Section heading “With robots” vs. “Experimental Tests”
- “Information on ... has been displayed in Table x.y” vs. “The information given in Table x.y is interesting because ..., in particular ...”
-

General points

- Don't aim at writing a text book (instead of a thesis).
- If you have more than 20 pages, you will need to check that writing is concise and focused.
- If you have less than 10 pages, improve structure, add figures, ask other people for suggestions.
- Formulas in introduction? No formulas or schemata elsewhere?
- Use “chapters” in the thesis. In RRR or RRP just sections (and several levels of subsections).

Comments

1) Use more than one subsection per section

- Avoid using the slash/solidus/virgule/stroke, when you mean “and”/“or”
- “A function $f(x)$ of x ” vs. “A function of x , $f(x)$ ” vs. “a function f of x ” vs. “a function $f: X \rightarrow Y$ ”
- And full sentences: “Where $x=1$.”
- Be consistent in using punctuation marks after display style formulas.
[Usually: after simple formulas, but not necessarily after complex ones]
- Don't use mathematical notation in text (“ $x = \text{state}$ ”, “we use ≥ 6 robots”), don't use text in arguments “ $f(x \text{ which is odd})$ ”
- spell out numbers (“six robots or more”) for numbers smaller or equal to twelve. unless it's a value of variable (“the optimal number of robots in this task is 6”)
- Use variable x always in the same font, whether x is used in text or x is used in display mode .
- Don't use double spacing unless explicitly required.

Comments

Always leave a space after commas and full stops, except, e.g., if another punctuation mark follows.

Never leave a space before punctuation marks.

Include simple formulas into the sentence structure, i.e. use punctuation after formulas

The “=” sign may or may not be the verb of a sentence.

- its or it's? there or their? dependence or dependance?
assistant vs. assistent?
- Don't use apostrophe's, except for genitive's, i.e.
can't → carrot, don't → donut

TLAs (and MLAs)

MDP, ASR, DA, CRF, RNN, DST, POMDP, RL, ASCTI, ATIS, WOZ, BLEU, LSTM, XENT, LM, EOS, DNN, MMI, DRL, RL-NTM, PRL, DPL, ROUGE, ED, METEOR, DARPA, “three main components of SDS – SLU, DM, NLG”

LEO, GEO, RSO, SSA, CMOS, COTS, FoV, NNSF, JPDA, MHT, RFS, FISST, PHD, CPDH, GM-PHD, NUC, SLAM, DAOPHOT

Add a TLA list when using more than seven non-generic TLAs.

Don't mention non-generic TLAs unless used again.

TLA: Three-Letter Abbreviation

More Comments

These would be too many Refs.: [4, 5, 6, 8, 15, 16, 17, 20, 21, 23, 24, 25, 27, 29, 32, 37, 39, 42, 45, 47, 49, 52, 54, 55, 56, 58, 59, 60, 61]

Here you would need some: “Most swarm platforms have a common locomotion method, ...”
...

- Don't leave lots a white space. (LaTeX may need some help to align the figures.)

References

Use either [a number] or Name et al. (year) not both (N. O. Body 1967 [17]).

“In F. N. Name et al. 2011 they have shown ...”

Use named references as part of sentence:

“F. N. Name et al. (2011) have shown ...” or as footnotes “... has been show (F. N. Name et al., 2011).”

Treat numerical references like footnotes:

“Evidence [3] exists [4], see also Ref. [5].”

Consider using natbib which provides `\citep` and `\citet` for, resp., parenthetical and textual citations.

Citing several papers [1,2-4,25-42]

Why is the second (etc.) paper still relevant?

If there are three important papers you'll need to cite three.

Independent work by several groups?

Any development or grouping?

How many references to prove that “many great algorithms have been published”? Find a review!

Isn't one evidence good enough? In empirical studies confirmation may be important.

Use one bracket, i.e. not as: [1], [2]-[4], [25]-[42]

Clarity and Style

Evaluative statements: Make clear whether the reference is for the matter [17] or for the evaluation [18]; for a distinction as such or any of the items that are set apart.

“A reference, unless given as Ref. [20], is usually not a grammatical part of sentence [21].” vs. “[20] has shown ” or “ ‘... sentence.’ [22]”? Used after “.” after quoting full sentences.

Citation styles: [Names, year] is often more informative than numbers [23], but in technical papers either is fine

Don't need to give reference for “basics” (e.g. content that has been taught in R:SS, unless it's an actual paper)

Back-references (i.e. including pages where cited, in the bibliography, LaTeX) are quite handy in academic texts

Motivation

The project is not the motivation. What is to be motivated is the project.

You can derive motivation from (a combination of)

- various benefits expected from the solution
- public needs, tax-payers interest, health etc.
- a puzzling question (so it may be the need of a small group of scientists)
- authority (“Already Berthold Horn considered X important”)
- correcting an error (“Hawking wrongly stated that ...”)
- an accessible example (“Who hasn't admired the seemingly effortless flight of birds?”)
- anything that catches the readers attention
- simplification, generalisation, optimisation, explanation

Level of detail

A literature review

- guides through the literature of a certain field
- provides a high-level understanding of the main points
- proposes a structure or new order for the field
- promotes the field by identifies emerging applications current solutions, but also shortcomings, open questions

It does not teach the field or aim at reaching the level of detail of a text book on this field

It may be useful to include one or two detailed examples in order to be clear on what you are talking about

Addressing a specific community

Identify the addressee of a paper by level

- “debate”, experts, disciplinary, introductory, interdisciplinary, popular, outreach, entertaining (these are not mutually exclusive)
- not too rarely there is simply no addressee

For RRR/RRP:

- Think of your fellow students as a target group
- Use an introductory level

General rule:

Assume zero prerequisites,
and infinite learning capacity

In other words: No need to repeat explanations, but avoid ambiguities, for which purpose labels can be used:

“Case A.2”, “Eq. 2.7”, “Condition Z.2”, etc.

Don't overdo it and make sure all labels are defined and retrievable

Figures

Find a good size (in cm or % line width?)

All lettering is meant to be readable (≥ 8 pt)

Check informativeness of the picture

Provide a reasonable amount of explanation in figure caption. A reference is good, but not enough.

Don't use webpages as references, unless there is no other option (then: Is it relevant?)

It is not wrong to consider aesthetic aspects

Tables

There were a few instances where a table would have been useful

Like figures, tables call for some explanation

- what is the important information/message
- which differences are significant

Tables can be boring, e.g. if only binary information is given

Prefer graphical over tabular representation

Dogberry

Marry, sir, they have committed false report;
moreover, they have spoken untruths;
secondarily, they are slanders;
sixth and lastly, they have belied a lady;
thirdly, they have verified unjust things;
and, to conclude, they are lying knaves.

Much Ado About Nothing (Shakespeare)

Towards a workplan

Do the discussed approaches show any gaps, or unused potential?

Are combinations with other approaches promising?

Why has the potential not been used before?

- it just became visible
- they suffered from limited resources

You will need (to be able) to reproduce existing work. This is a first step.

now: Hypothesis, Realisation, Evaluation (as discussed before)

Where are you now? (with your RRR)

Field more or less defined?

Main message(s) clear?

Table of content fixed?

Draft for some parts?

Some parts finished?

Some bits and pieces missing?

Just a bit of polishing needed?

get input
from your
mentor

get an
opinion
from your
mentor

great

Towards RRP

Concentrate on methods, workplan etc.

Reconsider literature review after these parts are by and large finished

- streamline review towards your project goals
- focus and clean up
- add recent papers
- include contrasting views

Check which of the literature is under your control:
Can/could you reproduce existing results? Do you have access to software? ...

Improve motivation, style and argument

Keep up the good work

Outlook: RRP Structure

- Introduction (motivation)
- State of the art (literature review)
- Hypothesis
- Exposition
 - Approach (methods)
 - Research plan (first steps, overview)
 - Evaluation (criteria)
- Discussion (potential difficulties, fall-back options)
- Conclusion (impact, outlook)