Report and Paper Checklist

Electrical Engineering, Indian Institute of Technology Bombay. Version: 2018.10.27.

Notes on usage:

1. It is recommended that this checklist be printed for each report. Each item should be checked by the author first, and a buddy colleague who is willing to help the author. Ideally, put check marks in the boxes before you send the report to your professor.
2. The first step should be to write an outline, get it read by the buddy colleague, and get it approved by the senior author (professor) in a discussion session to explain the whole outline. The key thing about the outline is to agree on the main points to be made in the publication and the results to be generated to support those points in addition to agreeing on the flow. The final results should be generated as per the outline and effort should not be wasted in generating all results before the outline has been discussed.
3. The next step should be to actually write the paper or the report as per the outline. Any required changes to the outline that become apparent during the course of writing should be discussed with the buddy colleague or the senior author.
4. Read 'The Elements of Style' by Strunk and White: http://www.jlakes.org/ch/web/The-elements-of-style.pdf

Checklist:

☐ **Outline:**
- ☐ *Never start writing before writing an outline.*
- ☐ Check the submission avenue for guidelines on length and sections before writing the outline.
- ☐ Write down your target audience, the background you assume they have, and your goal with them. For example, for a thesis the audience is general electrical engineers, while for a conference paper they are domain experts. The goal of the conference paper is to share exciting results that inspire action (and for the reviewers to be convinced to accept the paper).
- ☐ The outline should be a nested bullet point summary where each bullet point conveys roughly one paragraph of text or a figure or a table.
- ☐ Do not write uninformative bullet points such as "Disadvantages". Instead write "Disadvantages include slow speed and the need to annotate input examples."
- ☐ Don't be boring or meaningless. If you cannot make your audience care about your work, then nothing else matters.
- ☐ Don't be wrong. If you are unsure about a point, then state that it cannot be resolved or avoid it.
- ☐ Break complex ideas into multiple bullets, which you will later expand into paragraphs. Similarly, break the complex points needed to prove a theorem into separate lemmas.
- ☐ Revisit the outline to make sure that there is a coherent story and lucid flow.
- ☐ Introduction should cover the following:
  - ☐ Go from a broad area description to a specific problem statement.
  - ☐ State why it is an important problem.
  - ☐ State why it is a hard problem.
  - ☐ Give a brief outline of other efforts.
  - ☐ Relate your effort to those notable other efforts in terms of similarities as well as novelty. *Your contributions should be made clear*.
- ☐ Conclusion and discussion:
  - ☐ Go in the opposite direction from narrow to broad.
  - ☐ Convey implications of your work and the new questions it raises or new directions it shows. It should not be a rehash of the abstract and the introduction.
- ☐ Every other section should start with a summary of the section, followed by major modules in subsections.
  - ☐ For example, literature survey should first start with how you view the other techniques in the literature as major categories. For instance, it can be organized either chronologically by breaking pre-deep learning and deep-learning techniques into two separate subsections, or based on category of techniques e.g. "Pixel-wise segmentation" vs. "Super-pixel-based techniques".
  - ☐ Similarly, the section on proposed approach should start with a high-level overall description and a block diagram or a flowchart. Each subsection can describe the parts of the solution.
  - ☐ Results section should also start with an overall statement stating what aspects were tested and how the experiments were designed. Then go into each experiment.
- ☐ Give examples to illustrate results.

☐ **Paragraphs:**
- ☐ Break ideas into paragraphs so that typically *only one specific idea* is explored in each paragraph. Break complex ideas into multiple paragraphs, if needed.
- ☐ Paragraphs should usually have a *topic sentence*. It is the first sentence that sets the expectation for what is to come in the paragraph.
- ☐ The last sentence of each paragraph can be used to link to what comes thereafter.
- ☐ The sequence of sentences should have some logical order such as chronological, logical (rule, premise, conclusion), or most important to least important.
- ☐ Make sure that the next sentence or paragraph has something expected based on the previous one.

☐ **Sentences:**

- ☐ Many mistakes in grammar and structure happen because of lack of clarity of ideas that need to be expressed. Say the idea in your mother tongue if needed. Keep the idea for a sentence simple.
- ☐ *Avoid long sentences*. See if you can break up long sentences into multiple sentences.
- ☐ Avoid sentence *fragments*. These are clauses that do not stand on their own such as the second sentence in: "There was a heavy fog that blinded me. Hard to see the road."
- ☐ Avoid *run-on* sentences and break them into two sentences, for example the following should be split: "There was a heavy fog it was hard to see the road."
- ☐ Do not begin a sentence with an equation number, reference number or mathematical expression.
- ☐ Do not use numerals in descriptive prose, e.g., "There are 2 possible directions one may take from here." Instead write "… two possible directions …"
- ☐ Use `in order to' when it conveys an intention better than `to', e.g., when there are already a few occurrences of `to' in the same sentence. Otherwise use `to'.
- ☐ Do not use informal language. Instead of "This theory should be taken with a pinch of salt," you might say, "It needs more work to show that this theory applies in all cases."
- ☐ Use active voice where possible.
- ☐ Specific experimental descriptions should be made in past tense, e.g. `We used images from the ImageNet dataset.' General description of the algorithm can be in present tense, e.g. `Our algorithm takes two inputs.'

☐ **Words:**

- ☐ Avoid superlative or bombastic words and phrases, e.g., `It would be sheer utopia if this equality was always true.'
- ☐ Avoid arbitrary capitalization of the first letter of words simply because they sound technical. Capitalization should be reserved for words whose stem is a proper noun. For example in 'prostate cancer' and 'Gleason grading', only 'Gleason' is based on the name of a person.
- ☐ Avoid mixing homophones etc. e.g. 'loose' vs. 'lose', 'accept' vs. 'except'.
- ☐ Avoid using informal words such as 'like' instead of 'such as', or 'ur' instead of 'you are'.
- ☐ Choose a precise word among synonyms such as among 'look', 'see', 'observe', 'glance' and 'watch'.

☐ **Spell check:** *Run a spelling and grammar check. Your report should not leave your hands without this step.*

☐ **Citations:**

- ☐ Any idea taken from anywhere should be cited closest to the place where it is used.
- ☐ Figures and tables taken from other sources should have a citation in the caption.
- ☐ If more than a few words are copied verbatim from another source, these should be in "double quotes." Such occasions should be rare.
- ☐ Even if you got an idea from someone in a personal discussion, cite them by saying `in personal communication with X.'

☐ **Equations and mathematical expressions:**

- ☐ Try to explain all technical details using mathematical expressions and numbered equations.
- ☐ All equations and mathematical expressions taken from other sources should be re-written using an equation editor.

☐ **Figures:**

- ☐ Put effort in making good and informative figures. Many readers like visual information.
- ☐ Consider highlighting key portions of the figure to draw the reader's attention.
- ☐ For line drawings, use vector graphics (e.g. pdf and svg) instead of raster graphics (jpg, png). The former scales better when an electronic page is resized on a screen.
- ☐ Make sure that the important details are not very small, and can be seen in a monotone print.
- ☐ Captions should be informative and below the figure.

☐ **Tables:**

- ☐ Use legible font size.
- ☐ Numbers to be compared should be in the same format, for example with a fixed number of places after the decimal, with consistent use of commas or scientific notation.
- ☐ Avoid excessive precision (digits after decimal). Go up the smallest precision that conveys the message.
- ☐ Numbers should typically be right justified.
- ☐ Text should typically be left or center justified.
- ☐ Column header justification should match that of the rest of the column.
- ☐ Captions should be informative and above the table.

☐ **Formatting:**

- ☐ All fonts should be legible in size.
- ☐ Use a standard template.
- ☐ Do not overcrowd. Avoid using negative vspace in LaTeX to cram in a page limit.
- ☐ Keep formatting consistent. Do not switch fonts, sizes, and style without cause.
- ☐ Make good use of numbered and bulleted lists, but do not overdo it.
- ☐ Citations should be in IEEE format by default, unless required otherwise.