TEG characterization

Name Surname student_1, *Student ID number, ...*,
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***Abstract*—The abstract goes here. The abstract should resume your report in few sentences.**
1) Surround the context;
2) Motivate the goal of the work;
3) Anticipate the most important results or achievements.

200 words maximum

I. Introduction

THIS demo file is intended to serve as a "starter file". The template can be found here [1]:
- On DidatticaOnLine, web page of the course.
- http://www.ieee.org/conferences_events/conferences/publishing/templates.html

The introduction should take 3 columns and the main purposes are:

- Describe the problem;
- State the contributions of the project work.

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The best way to tell the story is to organize the introduction in 4 parts:

1) Introduce the context of the work (e.g., internet of things, artificial intelligence, industrial electronics, smart grids, ...). Describe also the possible scenarios where the project can be used. Then highlight the open challenges or issues and problems to be solved ($\approx$ *one column*);
2) Describe possible solutions, new technologies, or recent innovations that can fill the gap and solve the open challenges. You can cite some recent papers, scientific articles about such technologies. Then, start to describe the work done and the project objectives ($\approx$ *one column*);
3) State the contribution of the project. The list of contributions drives the entire report: the rest of the pages substantiate the claims you make here. Use bullet list for the contributions ($\approx half\ a\ column$);
4) Describe the organization of the report. (e.g., ... *The rest of the report is organized as follows. Related Work is reviewed in Section II. Section III presents the technology used; we describe the hardware and software developed in the project. ... Section X describes simulation and experimental results compared to state-of-art. Section N concludes the report.*) ($\approx half\ a\ column$).

II. Related Work

This section is necessary and should take about 1,5 column. Please take the time to read and report some scientific papers related to the activities done in the projects. Try to describe what the authors of the papers did, what they achieved. Then try to compare their work to your project. What is different? Do you outperform some of the articles you find? Did you demonstrate it? A state of the art of 4-5 papers is enough.

Literature search can be started using the following libraries: IEEExplore, Google Scholar, ACM digital libray.
- https://ieeexplore.ieee.org/Xplore/home.jsp
- https://scholar.google.it
- https://dl.acm.org

Some library needs a subscription. The university provides access to the most important digital library. Connecting from the UNITN intranet network permits you to browse and download documents with no problems. If you are out of the UNITN intranet, you need a VPN. Information about the university VPN-OUT can be found here:

- https://icts.unitn.it/case/it/catalog/vpnout/
- https://wiki.unitn.it/pub:conf-vpn-out

You may start a literature search from some Keywords related your project work. Then, we you find something relevant, you may use several strategies:

- Focus on the authors. If the authors work on a specific topic, they probably have published other research results in the same field. (Search based on authors).
- Focus on previous works. The last part of a scientific paper contains the bibliography. The references link to previously published papers, that the authors consider essential to understanding their manuscript. They deserve a brief overlook at least, and likely you may find useful information on the topic (Back to the past)
- Focus on who cited the paper. All the digital libraries (e.g., IEEE, Google Scholar, ...) provide a metric about how many later-articles, have cited the paper. If the paper is quite recent, and yet collected a quite high number of citation, maybe it is worth to open it and check (Jump to the *future*).

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Please, consider that the ICT innovation paces very fast. Apart from few cornerstones, papers of 5-years ago probably contain already outdated information and technology. Thus prefer focusing on articles no earlier than 3-4 years ago..

III. Description of the work for the project

Now you can start to organize the description of the project work into Sections. You can use how many sections you prefer. Keep in mind the follwing advices:

- Explain it as if you were speaking to someone using a whiteboard;
- Conveying the intuition is primary, not secondary;
- Once your reader has the intuition, she can follow the details (but not vice versa)
- Even if she skips the details, she still takes away something valuable.

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The Problem Statement is usually one of the firsts sections. Then, you may prefer to focus on the Hardware blocks of your project or the Software. Please, spend some columns about the developed algorithms and try to explain clearly and simply. (i.e., any engineer should understand, not only super-expert of the topic).

Do not leave any contributions tacit or implicit. Dig into the description of your work, do not suppose as already understood by the reader (apart common engineering background knowledge. For example, FFT, Shannon theorem, ...)

IV. Tips

A. Figures, Schematic diagrams, plots, tables...

Any graphical representations you want to add is very welcome. Please add in the text a detailed description of what you have added. Explain why you added the figure (therefore, avoid marketing figures, please), the meaning, and what the figure represents. If it is a plot or a chart, please, describe the axes, their unit, and what is the lesson learned from watching the plot. If it is a table, please, describe the meaning of the rows, columns, and the noticeable data you would light to highlight in the table. Write a comprehensive description of the plot in the text and add a useful and informative caption to each graphic element.

B. Use the active voice

The passive voice is *respectable* but it deadens your report. Avoid it at all costs.
Examples:
It can be seen that... ⇒ We can see that...
34 tests were run ⇒ We ran 34 tests
These properties were thought desirable ⇒ We wanted to retain these properties...
It might be thought that this would be a type error ⇒ You might think this would be a type error ...

C. Use simple, direct language

Examples:
The object under study was displaced horizontally ⇒ The ball moved sideways
On an annual basis ⇒ Yearly
Endeavour to ascertain ⇒ Find out
It could be considered that the speed of storage reclamation left something to be desired ⇒ The garbage collector was really slow

D. Give strong visual structure to your paper

You can use: Sections and sub-sections, lists, tables, ...

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laid-out code
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- bullets;
- bullets.

V. Experimental results

Add a Section about experimental results and verification of your output.

Any number, both final and intermediate results should be described. Even the experimental setup, and the measurement environment should be described. The measure should be reproducible by the readers. Listing the models of the instrument is not important (e.g., oscilloscope TD98445....), while the type of instrumentation or the type of measure is fundamental to repeat the experiment.

In case, please, provide a shared folder (e.g., github, gitlab, Google Drive, ...) where the code is available for repeat the experiments, the achieved results are available for a comparison.

VI. Conclusion

The conclusion goes here. Usually, the conclusion takes 15-20 lines (less than half a column) and should resume your told story.

Context/Scenario ⇒ Challenges ⇒
⇒ What you have done ⇒
⇒ most important achievements, with key numbers.
Moreover, you could add short anticipation of advisable future works and directions to improve or to extend the project (beyond your task).

For more information, please refer to [2]. For LaTeX information, you can have a look to [3] (Anyway LaTeX is not mandatory).
I wish you the best of success.

References

[1] (2020) The report template. [Online]. Available: http://www.ieee.org/conferences_events/conferences/publishing/templates.html
[2] (2015) The IEEE website. [Online]. Available: http://www.ieee.org/
[3] M. Shell. (2015) IEEEtran homepage. [Online]. Available: http://www.michaelshell.org/tex/ieeetran/