University College of Southeast Norway

Arduino Measurement System

Henrik Ibsen, Knut Hamsun

Abstract: There has been developed a hydraulic drilling simulator, which needs a graphical user interface (GUI) to be easily operated.
The goals of this project were to develop an easy-to-use GUI with a selected set of features.
A well-prepared abstract enables the reader to identify the basic content of a document quickly and accurately.

Keywords: PID, LabVIEW, Simulation

1   Introduction

A short introduction to your work, background, goal, constraints, etc.

2   Problem Description

You need to explain the problem with your own words, figures and sketches.

Figure 2.1 shows the system overview. We see that the system consists of a network.

Figure 2.1: System Overview

Remember to refer to all figures, tables and equations in the text.

3   Material and Methods

The main purpose of the 'Materials and Methods' section is to provide enough detail for a competent worker to repeat your study and reproduce the results. The scientific method requires that your results be reproducible, and you must provide a basis for repetition of the study by others.
Equipment and materials available off the shelf should be described.
In Figure 3.1 we see the control system developed in this project.

Figure 3.1: Control System

From eq. (3.1) we see that ….

$$y = ax + b \qquad (3.1)$$

Make sure to enter equations properly. See how it is done in different text books, etc.
Hundreds of code lines in the report makes no sense. You may include small code snippets in your main report if you think that is relevant for your project. The rest of the code could be in an appendix if it's not too much. 50-100 pages with code listing makes no sense in the report or in appendix.
A better way is to attach it in electronic form in some way, e.g. a link to a web site where you can download it.
You should also plan and document your code using flow charts (see example in Figure 3.2), etc.

Figure 3.2: Flow Chart

You may also use design techniques like UML (Sequence diagrams, use case diagrams, class

diagrams, etc.), etc. Use a proper tool like e.g., MS Visio or similar.

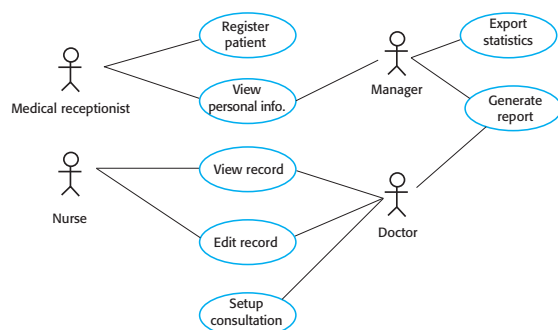In Figure 3.3 we see an example of an UML diagram.

Figure 3.3: UML Diagram

Below we see the C# code for the PI controller:

```csharp
bool myTest;

myTest=false;

if (myTest == false)
{
        MessageBox.Show("Hello1");
        MessageBox.Show("Hello2");
}
```

From the code, we see that …

4   Results

In the results section, you present your findings: display items (figures and tables) are central in this section.
In Table 4.1 the results are summarized. We see that the data…

Table 4.1: Weekly Data

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

5   Discussions

One of the most important things in your report is to analyze and discuss your results in details.

6   Conclusion

A Conclusion is always needed in a technical report or article. Here you shall summarize your results

and draw conclusions, not write how much you have learned, etc.
Bad examples:

- "I have learned much doing this assignment"
- "This was very useful, and I will need this when I get a job"
- "From this Lab, we understand the Kalman Filter much more and how to implement it in LabVIEW which also make us much better to use LabVIEW. We also learned how to design a feedforward controller to combine with a traditional PID controller and by comparison, we have better understanding that the usage of Kalman Filter and feedforward controller."

You should focus on your results, not just list up what you have done or how much you have learned by doing this, etc. It is nice that you have learned a lot, but this is not relevant!!

7   References

Example of Book with one author:
[1] J. Keats, Virtual words: language on the edge of science and technology. Oxford: Oxford University Press, 2011.

Example of Book with three or more authors:
[3] M. Fasting, et al., Den norske velferden. Oslo: Civita, 2011.

Web Site Example:
[4]   D. Robert, (2017, 12. 07). How do I write a scientific paper? [Website]. Available:
http://www.scidev.net/global/publishing/practical-guide/how-do-i-write-a-scientific-paper-.html

Master or PhD thesis Example:
[5] L. H. Daland, "Livskraften ebber ut: en undersøkelse av befolkningsendringen i utvalgte uthavnssamfunn mellom Lindesnes og Lista 1900-1970." Master Thesis, Kristiansand: University of Agder, 2010

E-book Example:
[6] C. Stansell. (2010). The feminist promise: 1792 to the present [E-book]. Available:
http://site.ebrary.com/lib/agder/docDetail.action?docID=10386235

Remember to refer to all your references in the reference list in your text, and in the same order as they appear in the list.

Appendices

Appendices contain information in greater detail than can be presented in the main body of the paper.