latex thesis template title

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January 1, 1970

IP-920bb

Abstract

Despite the fact that an abstract is quite brief, it must do almost as much work as the multi-page paper that follows it. In a computer architecture paper, this means that it should in most cases include the following sections. Each section is typically a single sentence, although there is room for creativity. In particular, the parts may be merged or spread among a set of sentences. Use the following as a checklist for your next abstract:

Motivation: Why do we care about the problem and the results? If the problem isn't obviously "interesting" it might be better to put motivation first; but if your work is incremental progress on a problem that is widely recognized as important, then it is probably better to put the problem statement first to indicate which piece of the larger problem you are breaking off to work on. This section should include the importance of your work, the difficulty of the area, and the impact it might have if successful.

Problem statement: What problem are you trying to solve? What is the scope of your work (a generalized approach, or for a specific situation)? Be careful not to use too much jargon. In some cases it is appropriate to put the problem statement before the motivation, but usually this only works if most readers already understand why the problem is important.

Approach: How did you go about solving or making progress on the problem? Did you use simulation, analytic models, prototype construction, or analysis of field data for an actual product? What was the extent of your work (did you look at one application program or a hundred programs in twenty different programming languages?) What important variables did you control, ignore, or measure?

Results: What's the answer? Specifically, most good computer architecture papers conclude that something is so many percent faster, cheaper, smaller, or otherwise better than something else. Put the result there, in numbers. Avoid vague, hand-waving results such as "very", "small", or "significant." If you must be vague, you are only given license to do so when you can talk about orders-of-magnitude improvement. There is a tension here in that you should not provide numbers that can be easily misinterpreted, but on the other hand you don't have room for all the caveats.

Conclusions: What are the implications of your answer? Is it going to change the world (unlikely), be a significant "win", be a nice hack, or simply serve as a road sign indicating that this path is a waste of time (all of the previous results are useful). Are your results general, potentially generalizable, or specific to a particular case? [1]

Contents

1 Introduction

1.1 Initial situation

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1.2 Problem

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1.3 Goal

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1.4 Structure

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2 Typography

2.1 Subsection headline

2.1.1 Subsubsection headline

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TODO: This is a TODO note to improve this and that.

2.2 Lists

2.2.1 Unorderered list

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– **Lorem:** ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore.

2.2.2 Orderered list

1. First point

2. Second point

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[1]This is a footnote: `https://loremipsum.de/`, accessed on 01.01.1970

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2.3   Tables

Headline 1	Headline 2	Headline 3
Data value 1	21.1	63.5
Data value 2	11.7	49.8
Data value 3	11.2	77.6

Table 1: An interesting table

2.4   Source code

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```python
import argparse


def say_hello(name: str) -> None:
    print("Hello " + str(name)) # Say hello


if __name__ == '__main__':
    parser = argparse.ArgumentParser()

    parser.add_argument('-n', '--name', type=str, required=True)

    args = parser.parse_args()

    say_hello(args.name)
```

Source Code 1: hello.py: Says hello to people that know how to handle it

3 Images

3.1 Text wrapping

As shown in figure 1 lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. [2]
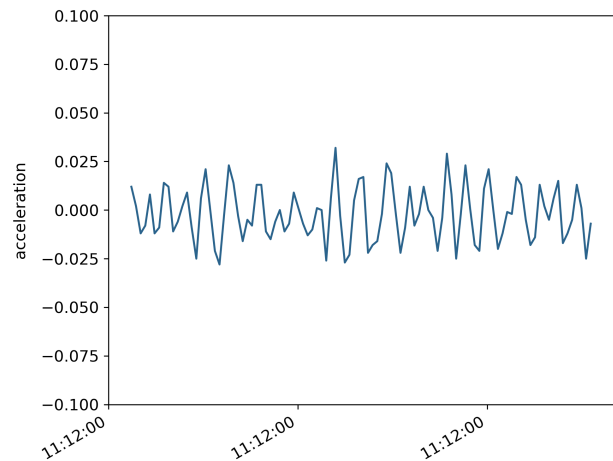
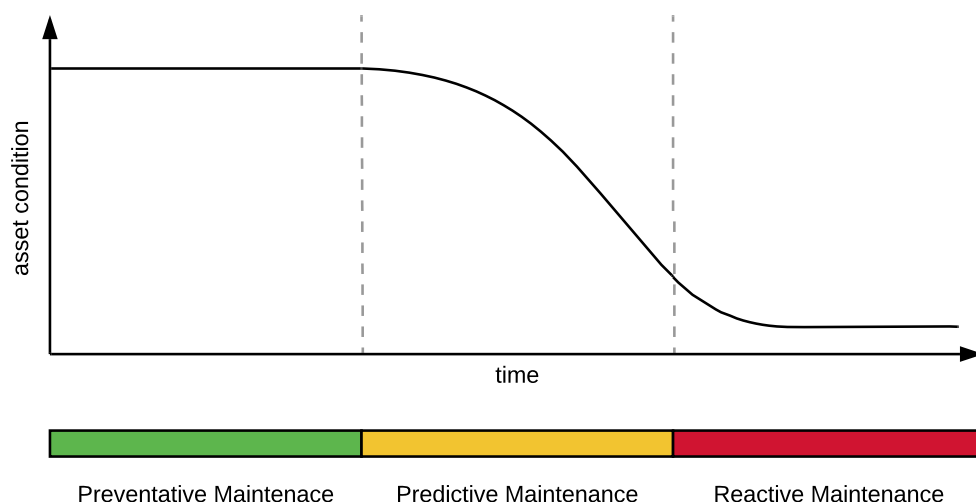Figure 1: Bearing acceleration of something

3.2 Centred image

Figure 2: Different types of maintenance
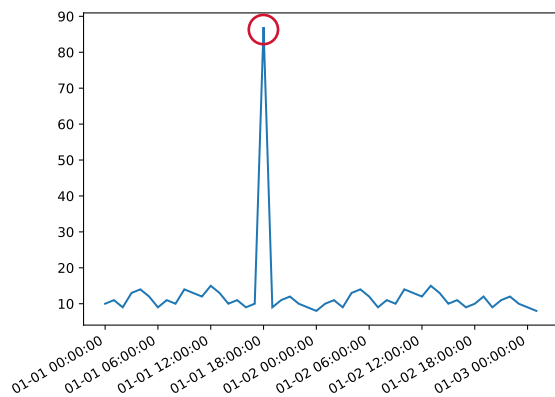
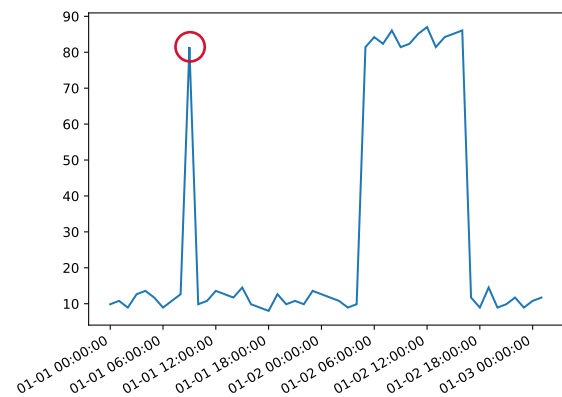## 3.3 Two images side by side

Figure 3: Point anomaly

Figure 4: Contextual anomaly
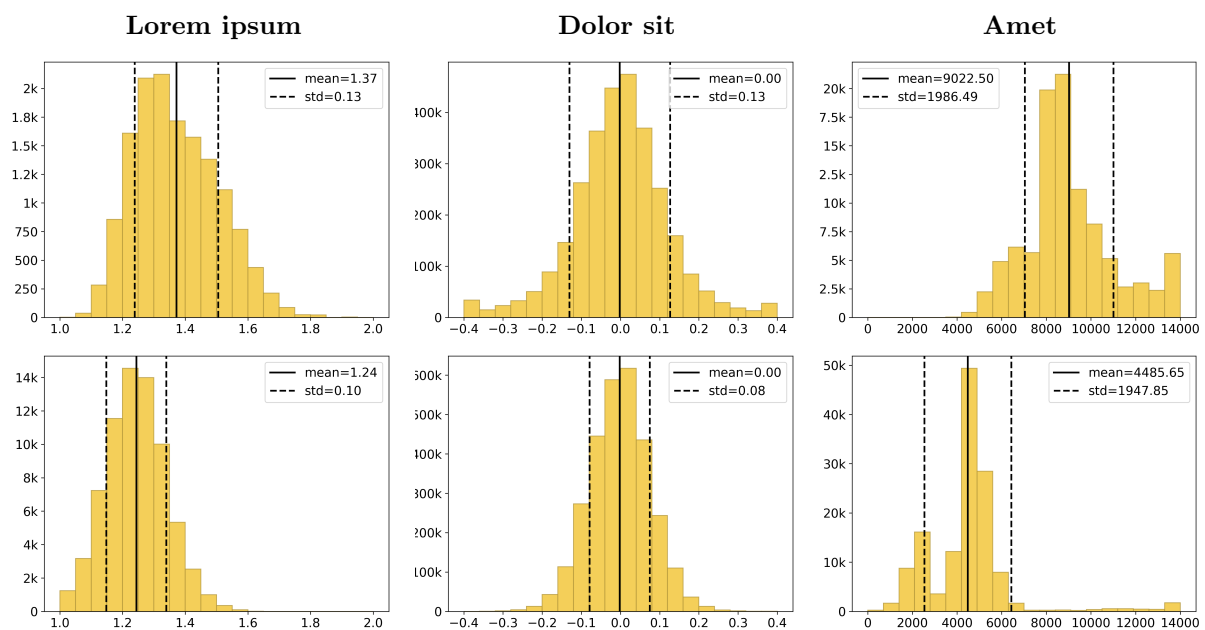
3.4 Three images side by side (one caption)

Figure 5: f.l.t.r. Histogram 1, Histogram 2, Histogram 3: Comparison of something (top row) and something different (bottom row)

4 Formulas

$$\mathbf{AVG} = \frac{1}{n} \sum_{i=1}^{n} a_i \tag{1}$$

The average calculated per data window neglects all the past data windows and is relatively sensitive to outliers. To make it more robust to temporary changes we can use the exponentially weighted moving average. It is a combination of the current data window and the past data windows. It weighs the current computed average by a factor α (e.g. 0.1) and all the past values combined by a factor $1 - \alpha$ (e.g. 0.9). It never really *forgets* about the past, but weighs past values exponentially less with each step.

$$\mathbf{EWMA}(\alpha)_t = \begin{cases} \text{AVG}_t, & \text{if } t = 1 \\ \alpha * \text{AVG}_t + (1 - \alpha) * \text{AVG}_{t\text{-}1}, & \text{if } t > 1 \end{cases} \tag{2}$$

$$\mathbf{MAD(X)} = median(\left| X_i - median(X) \right|) \tag{3}$$

$$\mathbf{P} = number\,of\,positives\,in\,ground\,truth \tag{4}$$

$$\mathbf{N} = number\,of\,negatives\,in\,ground\,truth \tag{5}$$

$$\mathbf{TP} = number\,of\,true\,positives \tag{6}$$

$$\mathbf{FP} = number\,of\,false\,positives \tag{7}$$

$$\mathbf{FN} = number\,of\,false\,negatives \tag{8}$$

$$\mathbf{recall} = \frac{TP}{TP + FN} \tag{9}$$

$$\mathbf{precision} = \frac{TP}{TP + FP} \tag{10}$$

$$\mathbf{F1\ score} = 2 * \frac{precision * recall}{precision + recall} \tag{11}$$

$$\mathbf{accuracy} = \frac{TP + TN}{P + N} \tag{12}$$

5   Conclusion

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Glossary

Lorem ipsum In publishing and graphic design, Lorem ipsum is a placeholder text commonly used to demonstrate the visual form of a document or a typeface without relying on meaningful content.

References

[1] P. Koopman. (1997) How to write an abstract. [Accessed on 01.01.1970]. [Online]. Available: https://users.ece.cmu.edu/~koopman/essays/abstract.html

[2] J. Doe, "The adventures of john doe," 2018.

List of Figures

List of Tables

Declaration of Academic Integrity

Hereby, I declare that I have composed the presented paper independently on my own and without any other resources than the ones indicated. All thoughts taken directly or indirectly from external sources are properly denoted as such. This paper has neither been previously submitted to another authority nor has it been published yet.

John Doe

Zurich, 01.01.1970

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Location, date   Signature John Doe

Appendix

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