A DESCRIPTIVE TITLE, NOT TOO GENERAL, NOT TOO LONG

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ABSTRACT

Describe in concise words what you do, why you do it (not necessarily in this order), and the main result. The abstract has to be self-contained and readable for a person in the general area. You should write the abstract last.

1. INTRODUCTION

Do not start the introduction with the abstract or a slightly modified version. It follows a possible structure of the introduction; omit the paragraph titles in your final version (related work and organization you can keep). Note that the structure can be modified, but the content should be the same.

Motivation. The first task is to motivate what you do. You can start general and zoom in one the specific problem you consider. In the process you should have explained to the reader: what you are doing, why you are doing, why it is important (order is usually reversed).

For example, if my result is the fastest DFT implementation ever, one could argue roughly as follows. First explain why DFT is important (used everywhere) and why performance matters (large datasets, realtime). Then explain that fast implementations are very hard and expensive to get (memory hierarchy, vector, parallel). Careful: don't overdo the motivation, only go as far as you would be comfortable explaining to an audience of experts. Now you state what you do in this paper. In our example: presenting a DFT implementation that is faster for some sizes as all the other ones.

Related work. Next, you have to give a brief overview of related work. For a paper like this, anywhere between 2 and 8 references. Briefly explain what they do. In the end contrast to what you do to make now precisely clear what your contribution is.

Organization of the Paper. Give a short one paragraph overview of the paper, like: In Section 2 we provide the background on the the discrete Fourier transform and its most important fast algorithms including their detailed cost analysis. In ...

The author thanks Jelena Kovacevic. This paper is a modified version of the template she used in her class.

2. BACKGROUND: WHATEVER THE BACKGROUND IS

Here you should give a short, self-contained summary of necessary background information. For example, assume you present an implementation of FFT algorithms. You could organize into DFT definition, FFTs considered, and cost analysis. The goal of the background section is to make the paper self-contained for an audience as large as possible. As in every section you start with a very brief overview of the section.

2.1. Discrete Fourier Transform

Precisely define the transform so I understand it even if I have never seen it before.

2.2. Fast Fourier Transforms

Explain the algorithm you use.

2.3. Cost Analysis

First define you cost measure (what you count) and then compute the cost. Ideally precisely, at least asymptotically. Also state what is known about the complexity about your problem (including citations).

Don't talk about "the complexity of the algorithm." It's incorrect, remember (Lecture 2)?

3. YOUR PROPOSED METHOD

Now comes the "beef" of the paper, where you explain what you did. Again, organize it in paragraphs with titles. As in every section you start with a very brief overview of the section.

For this class, explain all the optimizations you performed.

4. EXPERIMENTAL RESULTS

Here you evaluate your work using experiments. You start again with a very short summary, and then you explain the experimental setup (platforms, how you implemented it, versions of relevant software, etc.). "Experimental setup" is a good choice for first paragraph.

For this class you should specify at least: computer, architectural parameters (CPU frequency, cache sizes, ...), compiler and version, compiler flags. For benchmarks against other software: name and version number.

You have to

- Follow the guide to benchmarking presented in class in lecture 16, in particular
- Very readable, attractive plots (do 1 column, not 2 column plots for this class), proper readable font size.
- every plot answers a question, which you pose and extract the answer from the plot in its discussion

Every plot should be discussed (what does it show, which statements do you extract).

5. CONCLUSIONS

Here you need to summarize what you did and why this is important. *Do not take the abstract* and put it in the past tense. Remember, now the reader has (hopefully) read the paper, so it is a very different situation from the abstract. Try to highlight important results and say the things you really want to get across such as high-level statements (e.g., we believe that .... is the right approach to .... Even though we only considered the DFT, the .... technique should be applicable ....) You can also formulate next steps if you want.

6. FURTHER COMMENTS

Here we provide some further tips.

Further general guidelines.

- For short papers, to save space, I use paragraph titles instead of subsections, as shown in the introduction.
- It is generally a good idea to break sections into such smaller units for readability and since it helps you to (visually) structure the story.
- The above section titles should be adapted to more precisely reflect what you do.
- Each section should be started with a very short summary of what the reader can expect in this section. Nothing more awkward as when the story starts and one does not know what the direction is or the goal.

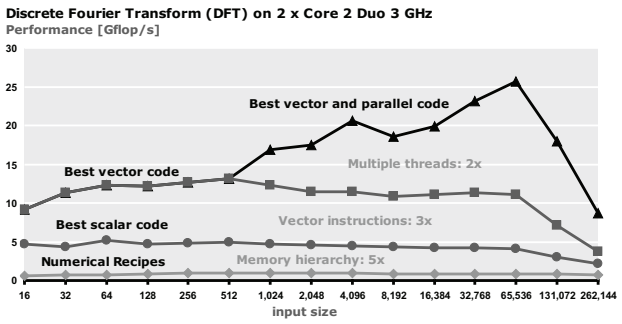

Fig. 1. Performance of four single precision implementations of the discrete Fourier transform. The operations count is roughly the same. *The labels in this plot are too small.*

- Make sure you define every acronym you use, no matter how convinced you are the reader knows it.
- Always spell-check before you submit (to me in this case).
- Be picky. When writing a paper you should always strive for very high quality. Many people may read it and the quality makes a big difference.
- Books helping you to write better: [1] and [2].
- Conversion to pdf (latex users only):

  dvips -o conference.ps -t letter -Ppdf -G0 conference.dvi

  and then

  ps2pdf conference.ps

Graphics. For plots that are not images *never* generate jpeg, gif, bmp, tif. Use eps, which means encapsulate postscript. It scalable since it is a vector graphic description of your graph. E.g., from Matlab, you can export to eps.

Here is an example of how to get a plot into latex (Fig. 1). Note that in this plot the text should be larger. In particular, the labels are too small!

7. REFERENCES

[1] N.J. Higham, *Handbook of Writing for Mathematical Sciences*, SIAM, 1998.

[2] W. Strunk Jr. and E.B. White, *Elements of Style*, Longman, 4th edition, 2000.