On the uses of LaTeX

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Abstract

This is my abstract. This document is a demonstration of the power of LaTeX as originally developed by Leslie Lamport. We describe the various features of LaTeX, demonstrate the inclusion of elements such as pictures, formulæ, and references. We conclude that LaTeX is a suitable system for producing professional papers for publication in high-impact journals.

1. LaTeX features

LaTeX was originally developed by Leslie Lamport [1] as a set of macros on top of the TeX language developed by Donald Knuth [2]. It has a number of features which make it well suited to professional scientific publishing, including the ability to typeset mathematical formulæ, justify text well, and include pictures at various points.

In section 2 we show some mathematical formulæthat can be used within LaTeX. In section 3 we demonstrate the inclusion of figures, including captions. Finally, in 4, we conclude that LaTeX is an excellent typesetting mechanism for scientific publications.

2. Mathematical formulae

Complex formulae are easy to produce within LaTeX. For example, we can use inline equations to define $f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$, and then provide more complex equations such as

$$\int_0^3 f(x)\mathrm{d}x = \left[\frac{a_3}{4}x^4 + \frac{a_2}{3}x^3 + \frac{a_1}{2}x^2 + a_0x\right]_0^3 \qquad (1)$$

If we have some derivation that should belong elsewhere, we can put it in an appendix such as Appendix A. We can also refer to equations from the main text such as the Taylor expansion 1.

3. Pictures

In this section we demonstrate the inclusion of figures. For example, Figure 1 demonstrates ENO as used to solve a linear advection of a top-hat function.

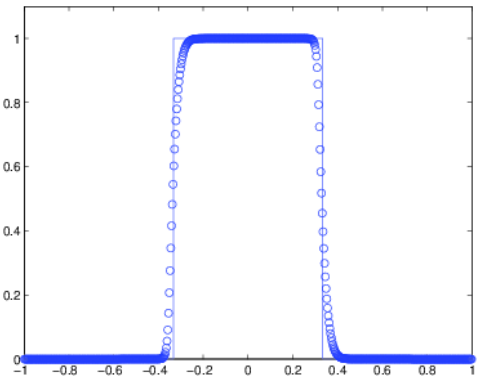

Figure 1: Demonstration of ENO as used to solver linear-advection of a top-hat function.

4. Conclusions

In which we conclude that LaTeX (or LaTeX) is very useful for generating scientific papers as demonstrated above.

Acknowledgements

Here I acknowledge the assistance of my supervisor, my industrial sponsor, and the effects of caffeine on my ability to produce this report on time.

Appendix A. On the Derivation of the Quadratic Formula

The derivation of the quadratic formula is something that would not fit well within a paper as it would in-

terrupt the flow of the argument therein. However, for those students who need a refresher on how the quadratic formula is derived, we give full details here:

Assume that we have

$$p(x) = ax^2 + bx + c \tag{A.1}$$

and so on. The actual algebra is left as an exercise for the reader.

[1] L. Lamport, LATEX: a Document Preparation System, Addison-Wesley, 1994.
[2] D. Knuth, The TeXbook, Addison-Wesley, 1984.