

# System Description: A Semantics-Aware L<sup>A</sup>T<sub>E</sub>X-to-WORD/ODF Converter

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**Abstract.** We present a L<sup>A</sup>T<sub>E</sub>X-to-Office conversion plugin for L<sup>A</sup>T<sub>E</sub>XML that can bridge the divide between publication practices in the theoretical disciplines (L<sup>A</sup>T<sub>E</sub>X) and the applied ones (predominantly Office).

## 1 Problem & State of the Art

Many researchers in STEM fields only use L<sup>A</sup>T<sub>E</sub>X to typeset their documents. However many people still use Microsoft Word/Open office exclusively for their typesetting. When these two groups of people intersect, it can lead to friction, as transforming text to L<sup>A</sup>T<sub>E</sub>X is quite trivial but not the opposite. For example if a conference requested documents in Word format, the only recourse is often to just write the document in Word, which is a pain, especially if any Mathematics is to be included.

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copy	paste (libreoffice)
$h_{\mu_\varphi}(f) + \int_X \varphi d\mu_\varphi = \sup_{\mathcal{M}(f,X)} \{h_\mu(f) + \int_X \varphi d\mu\},$	$h_{\mu_\varphi}(f) + \int_X \varphi d\mu_\varphi = \sup \{h_\mu(f) + \int_X \varphi d\mu\},$

**Fig. 1.** Copy & Paste in Word Processors

There are several methods to transform papers from L<sup>A</sup>T<sub>E</sub>X to an office word processor. The first method is to just generate a PDF file and then open this file in Word/LibreOffice. This achieves the goal of looking like the desired PDF document, just in Office. There are two problems with this route:

1. mathematical formulae are not preserved (see Figure 1)

However when later editing the resulting document, problems turn up.

<sup>1</sup> EDNOTE: Here we state the Problem, some conferences and admin want papers in word format, however LaTeX is superior for various reasons. Hence converter is needed. Two step process, wastes some time.

The fundamental problem is that it converts the appearance of the document and loses meaning due to macro expansion. This is especially blatant when looking at the math in a document. Either it is treated as text, with no meaningful way to distinguish between math and formatted text that happens to contain some mathematical symbols, making automatic treatment of this kind of math difficult, or it is represented by an image of the relevant formulae, which makes editing extremely impractical if not impossible. The same holds true for references, they are essentially treated as parts of text with a linked number in front of them, complicating adding new references substantially.

The other way of transforming L<sup>A</sup>T<sub>E</sub>X to Word, by transforming the .tex file directly, does away with some of these issues. Some editors to do this already exist, such as TeX4ht <sup>2</sup>. This already does this admirably, however it is very focussed on Libreoffice, e.g. it can't handle mathematics in docx files.

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## 2 Implementation

Both docx and odt files share a very similar structure and are almost interchangeable, except for slight differences in syntax and different names. At heart they are both zipped collections of XML files featuring one central document file and several supporting files such as styles, settings etc.

To create the .odt/.docx files we first transform the .tex file to an intermediate XML-based format using L<sup>A</sup>T<sub>E</sub>XML. <sup>3</sup>

Then we use XSLT stylesheets to semantically transform them to the required XML formats and finally zip it using the L<sup>A</sup>T<sub>E</sub>XML postprocessor.

<sup>4</sup> <sup>5</sup>

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## 3 Conclusion

In Conclusion we use L<sup>A</sup>T<sub>E</sub>XML and XSLT to transform L<sup>A</sup>T<sub>E</sub>X files to Word/Office files semantically in an easy to use process. <sup>6</sup>

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<sup>2</sup> EDNOTE: Hier einen link einfuegen glaube ich

<sup>3</sup> EDNOTE: Papa Latexml erlaerung einfuegen

<sup>4</sup> EDNOTE: Screenshot einfuegen

<sup>5</sup> EDNOTE: Bin eigentlich nicht zufrieden hiermit TT

<sup>6</sup> EDNOTE: In Conclusion, easy to use