Bryan Hughes' Dissertation Content

Note: Up-to-date versions of this document and the dissertation can be obtained through Subversion at <https://cvial-svn.ece.ttu.edu/svn/hughes_dissertation/Paper/Content/> It will complain about a self-signed certificate, but ignore that. If you do not already have access to the Subversion repository, just let me know and I'll set it up.

# Dissertation Workflow

The final copy of the dissertation will be typeset in LaTeX due to its vastly superior handling of large documents, document organization and support for merging multiple files, equations, references, etc. Since it's not very easy to compose content in LaTeX, everything will be written in MS Word first, and then translated to LaTeX once the content editing is finished. As a result, there is **zero formatting whatsoever in the word documents**. This means figures and such will not be the correct size, margins/etc will be off, and there will be a lot of wasted space. There is no point in spending the time to fix it when it won't have any effect on the LaTeX formatted copy where I have to fix everything again.

Another effect this has on the Word content is in the use of references. All references to figures/tables/sections/chapters, etc use the LaTeX method. A citation in the text looks like this:

\cite{ref:<year>-<author>-<document name>}

A reference to a figure looks like this:

\ref{fig:<Chapter Name>:<Figure Name>}

A reference to a table looks like this:

\ref{tab:<Chapter Name>:<Table Name>}

A reference to a chapter looks like this:

\ref{sec:<Chapter Name}

A reference to a section/subsection/etc. in a chapter looks like this:

\ref{sec:<Chapter Name>:<Section Name>:<Subsection Name>…}

The names are set next to whatever is being referenced to and looks just like the reference except that instead of being prefaced by \ref{ it is prefaced by \label{. This way everything is linked together and it will be very easy to use in LaTeX.

Another effect that using Word into LaTeX is that for equations I use an add-on called Aurora. This allows me to type in LaTeX equations directly and Aurora generates the typeset equation and inserts it into Word automatically.

A final note about Autocorrect: basically it needs to be turned off because otherwise it will insert non-ASCII characters that LaTeX doesn't recognize and are a pain to fix. To disable it: In Word 2007, click on the office button (round orb thing) and then select "Word Options." Select "Proofing" on the left. Click the "Autocorrect Options" button. In the window that pops up, select the "Autoformat as you type" tab. Uncheck everything in the "Replace as you type" area. In Word 2008, go to "Word->Preferences." Select "Auto Correct." Uncheck everything in the "Replace as you type section." Also make sure to use LaTeX quotes. LaTeX quotes start with two ` (tilde) and end with two ' (single quotes). So an example quote would look like ``this.''

One side note: I used the Word 2010 Beta to compose everything, and the Visio 2010 Beta to create the figures. I think everything should be compatible with Word 2007/2008, but I can't guarantee it. If you run into any problems, just let me know.

# Directory Structure and Contents

This directory contains the content of the dissertation. Each chapter has its own folder. In the root of this folder is a document called "<Chapter Name> Content.docx." This contains the content for the chapter. There are two subfolders in each chapter's folder: "Figures" and "References." The contents of these folders only matter if you intend to ***change*** figures yourself. Otherwise you can ignore them.

The Figures folder contains the Visio file (name "<Chapter Name>-figures") that contains the figure originals. There is also a PDF and PNG copy of each figure for use in the LaTeX and Word content files, respectively. These separate copies of the figures were created using a custom program I wrote in C# using Visual Studio 2010 (check it out at <https://cvial-svn.ece.ttu.edu/svn/hughes_dissertation/FigureSplitter/> using Subversion). I wrote it very quickly and crudely, so if the following dependencies aren't met, the program just crashes. This program depends on having the x86 binaries (even if you are on an x64 version of Windows) of Image Magick (<http://www.imagemagick.org/script/binary-releases.php#windows>), Ghostscript (<http://pages.cs.wisc.edu/~ghost/doc/GPL/gpl864.htm>), and PDFTK (<http://www.accesspdf.com/pdftk/>) installed. Note that relying on the path to locate Image Magick's "convert" command didn't work, so instead the path to "convert" is hard-coded in the code. Change it if the program throws an exception. To run it, open a command prompt in the Figures directory and run "FigureSplitter.exe <Chapter Name>-figures.pdf" and it will create all of the PDF's and PNG's automatically.

The References folder contains information about a reference in the document. References are named "<year>-<author>-<document name>" in the folder. If the document is a PDF document, the pdf is used. If it is something else, a text document that contains the book name/website/etc is used instead. Note: some of these may be out of date.

# Overall Document Structure

The order of chapters is:

1. Introduction
2. Hardware
3. SPI
4. Protocol
5. Routing
6. MPI
7. Future Work
8. Conclusions
9. Appendices