LaTeXME: LaTeX ON THE iPAD

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1. Description

LaTeXMe was created to provide TeX typesetting capabilities to iPads (it works for iPhones too), by editing and viewing documents in theses devices and typesetting remotely on a Mac running OS X[1]. It is comprised of two bash shell scripts, `latexme` and `detexor` (optional), and a `launchd` launch agent. Typesetting is done using TeXShop's typesetting engines.

2. The OS X side of things

2.1. **Requirements.** LaTeXMe requires the installation of the following.

(1) MacTeX (http://www.tug.org/mactex/, tested with MacTeX 2009).

(2) Dick Koch's TeXShop (http://www.uoregon.edu/~koch/texshop/, tested with version 2.33). Activation and use of Herb Schultz's `latexmk` engines, based on John Collins' `latexmk` perl script (included with TeXShop 2.33 and up, but not activated) is highly recommended (see the TeXShop help for instructions on how to activate, install and create engines).

(3) DeTeXor (http://www2.hawaii.edu/~ramonf/TeXShop/index.html, tested with version 2.4). DeTeXor is different from the `detexor` script!

(4) osxutils (http://osxutils.sourceforge.net/; Required by DeTeXor).

Make sure that both TeXShop and DeTeXor are configured before continuing (they must be run by double clicking them in the Finder first so that they create their preference files).

Additionally, you may want to install an FTP server to use some of the currently available iPad programs (see below for instructions on how to configure such a server).

2.2. **Installation.** The `latexme` and `detexor` (different from the DeTeXor application) scripts must be installed together in the same directory.

Make sure the scripts are executable, for example if they are installed in `~/bin` (where `~` stands for your home directory) type in the Terminal

```
chmod +x ~/bin/latexme
```

and

```
chmod +x ~/bin/detexor
```

Alternatively, use BatChmod (http://www.macchampion.com/arbysoft/BatchMod/Welcome.html) a nice free GUI for setting file permissions, owner and groups.

The LaTeXMe `launchd` agent

```
com.ramonfigueroacenteno.LaTeXMe.plist
```

[1]Tested with OS X 10.5 (Leopard) and 10.6 (Snow Leopard).

must be installed in `~/Library/LaunchAgents/`.

You must edit the LaTeXMe `launchd` agent with a text editor. For example, if you install the scripts in `~/bin` and you want the *root* directory that `latexme` watches (the directory that below we call `LaTeXMeDir`) to be `/Users/ftp/VirtualUsers/LaTeXMe`, your `plist` must be as follows,

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
<key>KeepAlive</key>
<true/>
<key>Label</key>
<string>com.ramonfigueroacenteno.LaTeXMe</string>
<key>ProgramArguments</key>
<array>
<string>/Users/ramon/bin/latexme</string>
<string>/Users/ftp/VirtualUsers/LaTeXMe</string>
</array>
<key>QueueDirectories</key>
<array/>
<key>WatchPaths</key>
<array/>
</dict>
</plist>
```

Notice, that instead of using `~/bin/latexme`, we used `/Users/ramon/bin/latexme`, since `launchd` needs full paths (in the author's case `~` resolves to `/Users/ramon`).

Finally, start LaTeXMe by entering in the Terminal

```
launchctl load ~/Library/LaunchAgents/com.ramonfigueroacenteno.LaTeXMe.plist
```

or by login out and then logging back in.

To stop the script you must enter in the Terminal

```
launchctl unload ~/Library/LaunchAgents/com.ramonfigueroacenteno.LaTeXMe.plist
```

Notice, that although `latexme` is running continuously, in our tests the *Activity Monitor* application reported that it only used 0.2% of one of the available processors (We only have a few folders in our hierarchy).

2.3. **How it works.** The script `latexme` continuously watches a hierarchy of directories, rooted in a directory that we will call `LaTeXMeDir`, to typeset TeX files in the hierarchy remotely, when instructed to. The script understands two *commands*: *Typeset* and *Cleanup*. These commands are issued to this script by placing files named `Upload to Typeset` and `Upload to Cleanup`, respectively, in the directory (`LaTeXMeDir` or a subdirectory of it) where the TeX files (suffix `.tex` only) you wish to process are located. All the TeX files in the chosen directory are processed, with the exception of files whose name ends in `.old.tex`,`.upload.tex` or `Template.tex`.

Note: `latexme` does not handle TeX files with spaces in their names!

Tip: Have template TeX files inside the hierarchy, which you can duplicate and rename to start a new document (that is why files that end in `Template.tex` are not typeset).

The *Typeset* command works, as TeXShop does, by looking at the first 20 lines of a TeX file for the first ocurrence of a line starting with `!TEX TS-program`, and then it uses the TeXShop engine specified there. For example,

```
!TEX TS-program = pdflatexmk
```

specifies the `pdflatexmk` engine. If no engine is defined

```
pdflatex --file-line-error --shell-escape --synctex=1
```

is used.

Tip: The `latexmk` engines are ideally suited to working with LaTeXMe as they run *LaTeX the correct number of times to resolve cross references, etc; it also runs auxiliary programs (bibtex, makeindex if necessary, and dvips and/or a previewer as requested).* They are smart enough to know when no changes have been made and there is no need to typeset.

If the optional `detexor` script is installed then the *Cleanup* command will trash all extraneous files (what is considered an extraneous file can be configured by running the DeTeXor application).

2.4. **PureFTPd Manager.** To use some of the available iPad software capable of editing and previewing TeX we must be able to access OS X through FTP (see below). Our choice was to install and configure *PureFTPd Manager* (http://jeanmatthieu.free.fr/pureftpd/). It has an *Easy setup assistant* that lives up to its name. There are however, a few things that we had to change:

(1) Under *User Manager* (*General* tab) we had to change the *User and Group*, `ftpvirtual` and `ftpgroup` respectively, to that of the same user and group of `latexme` (in our case `ramon` and `ramon`).

(2) Under *Preferences* we selected *SSL/TLS Sessions* and created a certificate and set *TLS Sessions* to *TLS Only*.

(3) Under *Preferences* we selected *Mac OS X* and there we switched from *Use Mac OS X Superserver* to *Use standalone mode* (This was needed in Snow Leopard, but not Leopard).

(4) We turned off anonymous user login.

Warnings: Since most TeXShop engines (including the default one) can do `--shell-escape` then potentially a malicious user can use LaTeX code uploaded and typeset through this FTP server to gain access to the rest of your computer. Do not use the same password for your server that you use for the rest of your machine.

3. The iPad side of things

On the iPad we need software that will allow us to access text files remotely on OS X to download, edit and upload them and see the resulting PDFs. What follows are the ones the author has tried.

3.1. **GoodReader (Version 2.7.7; $.99).** The cheapest option is *GoodReader*, which can download files from a variety of types of servers (including DropBox, but not SFTP) and has a superb PDF viewer. Unfortunately, the editor is very limited, and one cannot enter easily characters like `\` and `$`.

3.2. **Mides (Version 1.8.4; $14.99).** Its forte is that it does SFTP. Its editor does line numbering and the author is receptive to customer requests (adding a way to type `\` easily for example). However, it still needs more development before it is usable. All text files must be utf-8 encoded.

3.3. **Monkey Wrench (Version 1.51; $6.99).** It is a visually pleasing code editor (very nice line numbering) with, again, an author that is receptive to customer requests. However, it does not display PDFs (it will be part of an update in the near future, once it does we will revise this review). It does not handle unicode well. It only does FTP (it can do TLS/FTP, which secures you username and password). It has two modes one to edit files in the FTP server and another locally, but strangely one cannot transfer files between the two modes (you can copy and then paste). You cannot delete remote files.

3.4. **FTP on the Go Pro (Version 2.2.2; $9.99).** By far the most mature IDE that we have tested. It has almost everything one needs.

The editor handles multiple encodings, has a find and goto line commands and most importantly an extended keyboard that permits one to enter symbols easily. Alas, no line numbering or syntax coloring (see Figure 1).

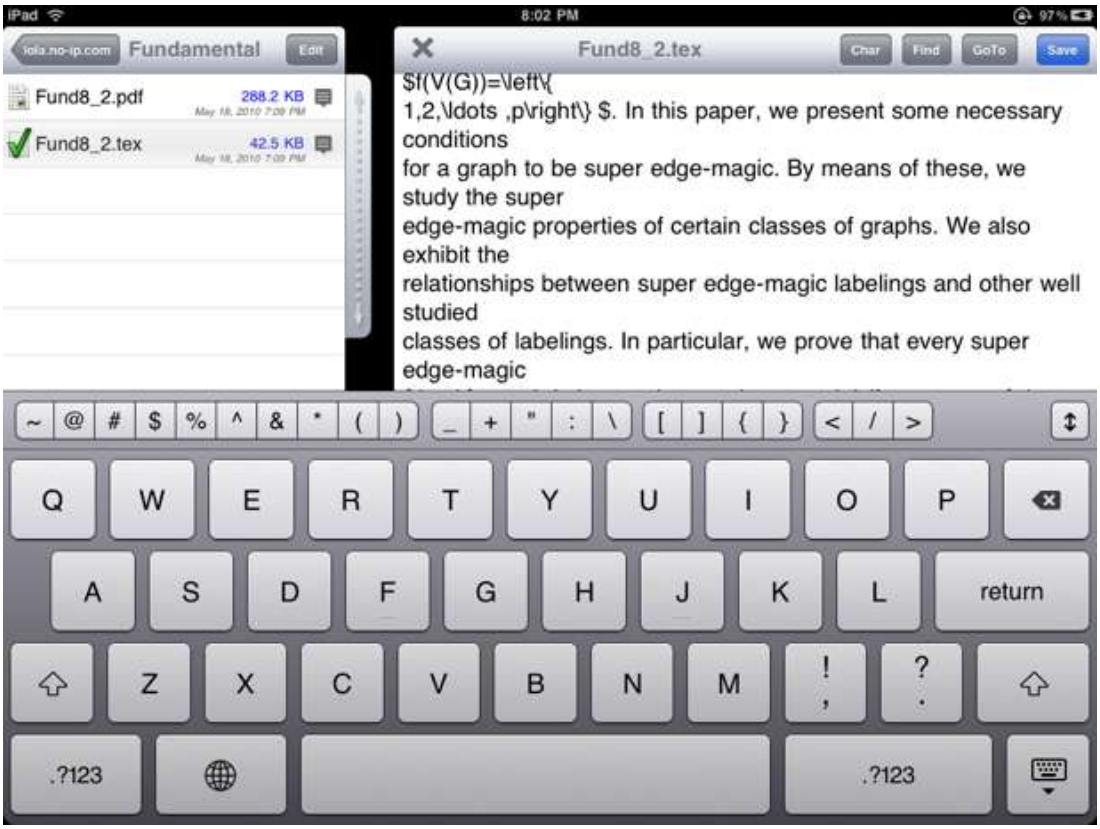

FIGURE 1. Editing in FTP on the Go Pro

One can navigate between directories and upload and download files easily (we keep files in the iPad named `Upload to Typeset` and `Upload to Cleanup` that we can upload to any directory containing a file we want to process to trigger LaTeXMe; see Figure 2).

The PDF viewer works well (See Figures 3 and 4). Although when looking at PDFs in full screen mode (Figure 4) one has to zoom out and then back in to see the file properly (the software author is aware of this bug).

One can e-mail any of the files directly from the program.

As of this writing it has a really odd set of bugs. When the iPad is lying on a flat surface some features do not work as expected. The solution is to hold it vertically (the software author is aware of this and hopefully will fix it in the next version).

Now, just like MonkeyWrench, it only does FTP (it does do TLS/FTP so secure usernames and passwords are possible). This is however, very well implemented (as one would expect form the program's name). One has access to a full FTP log and can send raw ftp commands.

4. HISTORY

1.0 Initial release.

5. License (GPL)

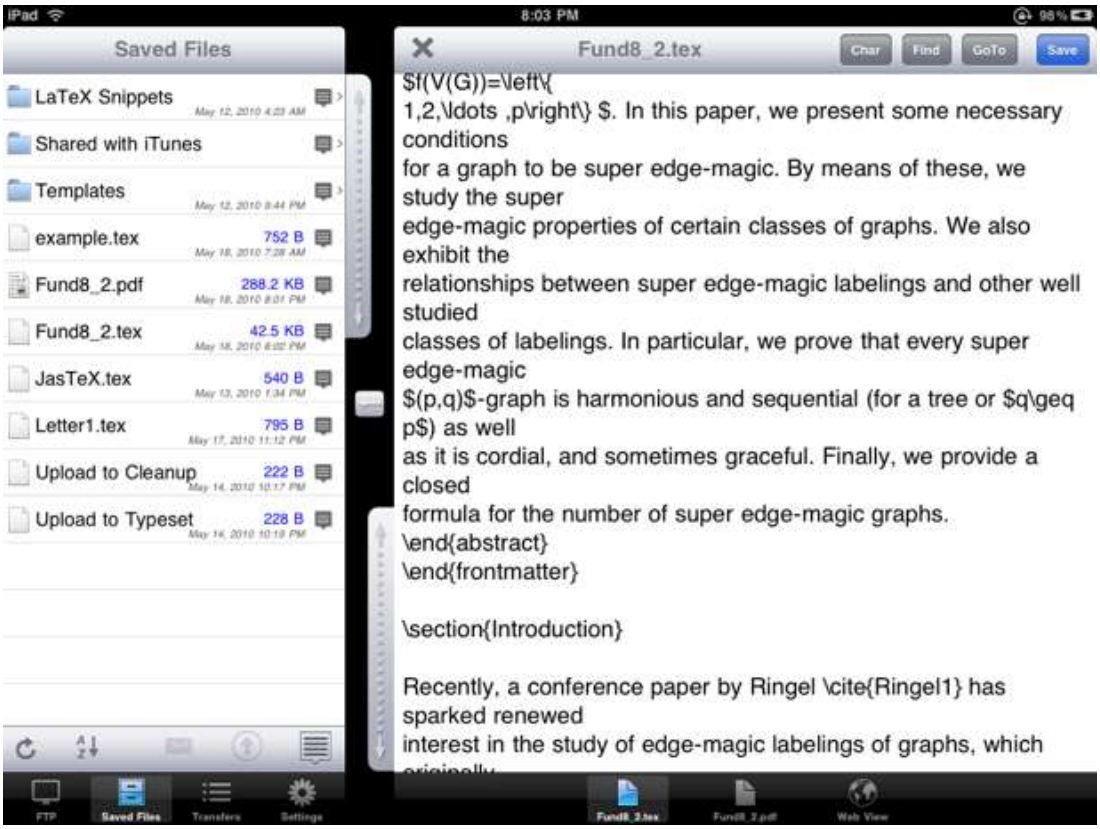

Figure 2. Local View in FTP on the Go Pro

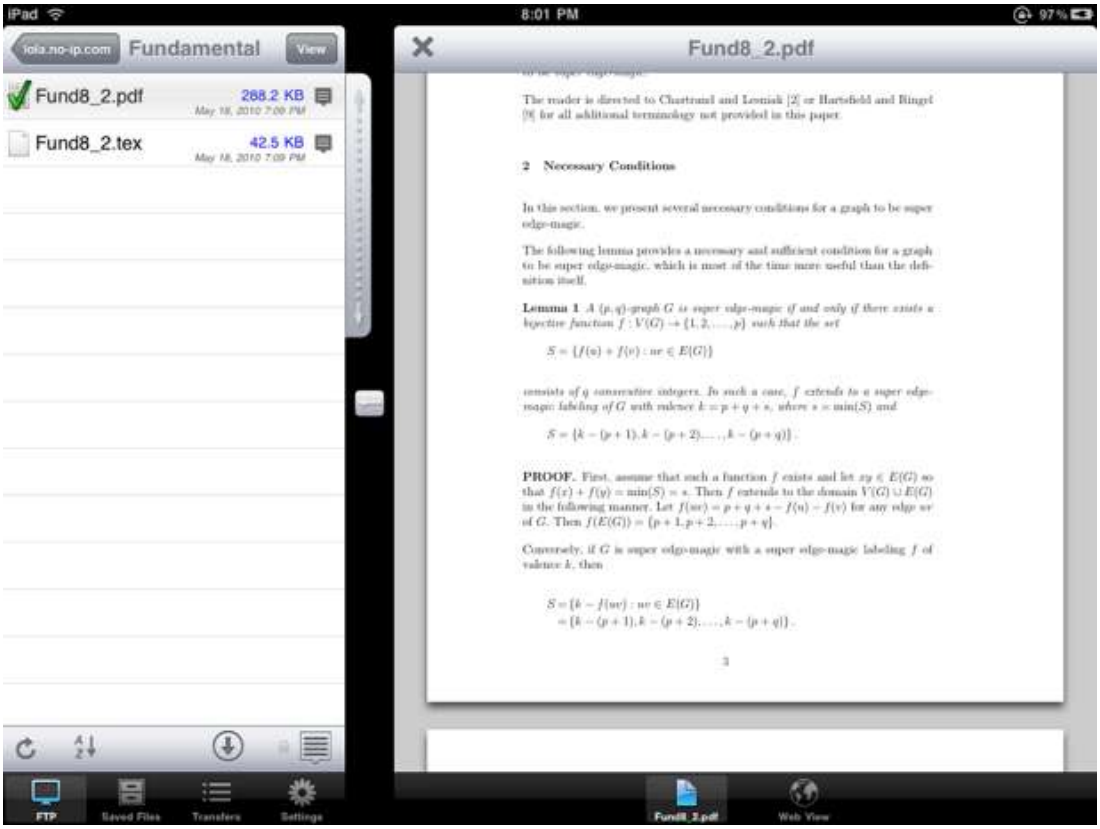

FIGURE 3. FTP on the Go Pro

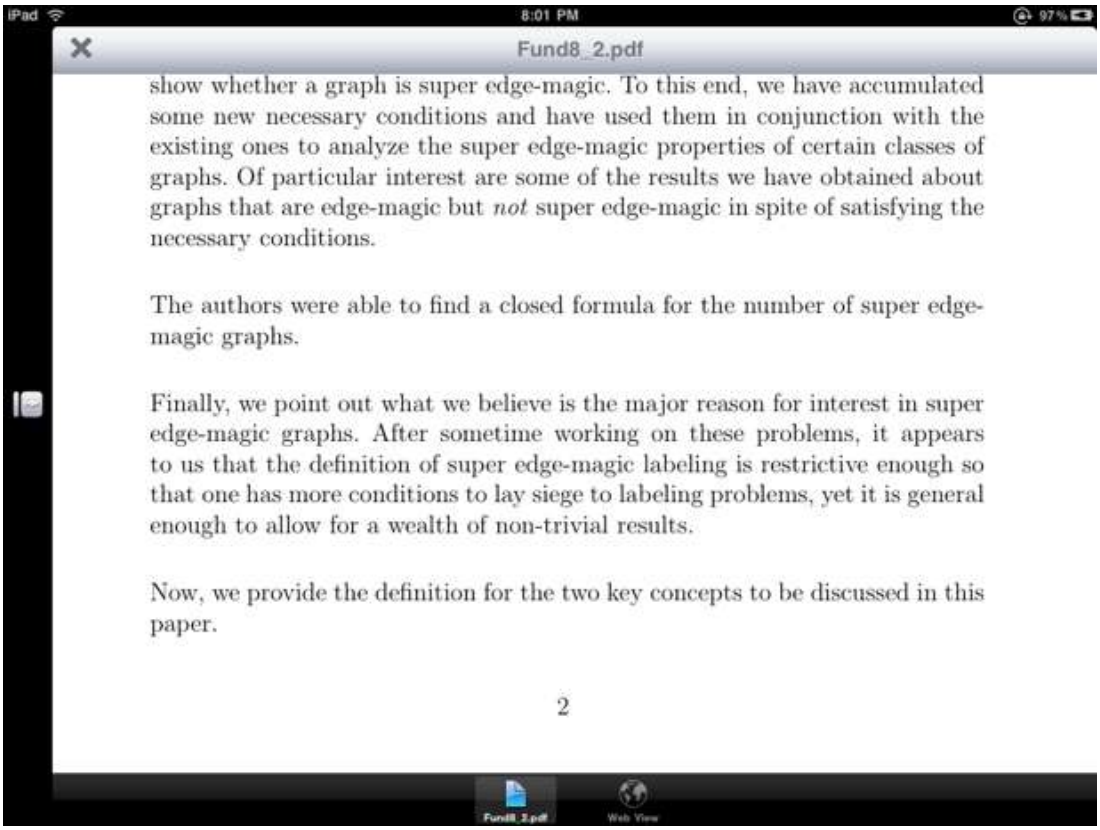

FIGURE 4. FTP on the Go Pro