

GeoTeX– Georgian Language in T_EX

Levan Shoshiashvili

Dept. of Electronics and Electrical Engineering
Faculty of Natural Science
Ivane Javakishvili Tbilisi State University,
I. Chavchavadze ave.N3 , Tbilisi, Georgia
shoshia@hotmail.com

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Abstract

In this document use of Georgian language package for T_EX/L^AT_EX is described.

1 Installation

For package installation T_EX distribution must be installed. This can be MikTeX or TeXLive Windows OS and TeXLive for Linux/Unix and MacOSX systems. It is not necessary, but it is better to have local T_EX directory. For Linux/Unix systems you can use `$HOME/texmf` See your T_EX distribution documentation for more details.

1.1 Using MikTeX on Windows OS

- Install MikTeX <http://miktex.org> .
- Create local T_EX directory. For example `D:\texmf`¹.
- Let system know about this directory

*Start → ProgramFiles → Miktex2.9 → Maintenance → Settings*²

¹Local directory must have T_EX directory tree structure

²This depends which Windows OS and what version of Miktex you have on your computer

- Change to second Tab (roots), turn on "Show MikTeX-Maintained root directories". you will see directories , which T_EX knows. Use Add." to choose local directory. For example D:\texmf.
- Go on the first Tab and do "Refresh FNDB"³.
- Download GeoTeX <http://tex.tsu.ge> and install it in local T_EX directory.
- Go back on the first Tab and do "Refresh FNDB". Now system knows about Georgian package T_EX files, but did not know about font map files.
- For this run *cmd* prompt as Administrator and run in console:

```
updmap --force --verbose
```

or

```
initexmf --mkmaps --force --verbose
```

- Do "Refresh FNDB" again. Now system knows about Georgian fonts and other files.
- Do "Refresh FNDB", but use "Maintenance Admin" option of MikTeX.

1.2 Automatic hyphenation

Automatic hyphenation works but for now (M_Arch 2013) is not included in distributions. Automatic hyphenation is done by `hyph-utf8` package. When MikTeX and TeXLive update this package Georgian will work out of the box. If you want to make system work for Georgian do following:

- update `hyph-utf8` from here <http://tug.org/svn/texhyphen/trunk/hyph-utf8/> ("Refresh FNDB" as above or `texhash` in console) Find `language.def` `language.dat` files⁴ in `c:\Program Files\MikTeX 2.9\tex\generic\config\` directory. Add entry for Georgian in `language.def`

```
% Note: the first line of this file must match the corresponding line
% in "etex.src" and "etexdefs.lib", otherwise fallback will be used.
```

```
% This is "language.def", e-TeX's language definition file.
```

```
% It is explicitly permitted to augment this file by adding additional
% \addlanguage ... commands AFTER the first (\addlanguage {USenglish})
% which must remain as the first language added to ensure total document
% portability for pre-\language documents. The last line of the file
% MUST be left as \uselanguage {USenglish} for the sane reason.
```

```
\addlanguage {USenglish}{hyphen}{2}{3} %% This MUST be the first
```

³This is same as *texhash* on console. Same command works on Linux/Unix OS

⁴or create them

```

% % non-comment
%% line of the file

% Additional languages, patterns, exceptions and left- and right-hyphen
% minima may be added here, and an example is given for German.
\addlanguage {georgian}{hyp-ka}{}{2}{2}
\def\l@georgian{\lang@georgian}

% The five parameters for \addlanguage are:
% language, patterns file, exceptions file, left- and right-hyphen minima

%%% Next section is      E X A M P L E   O N L Y
%%% \addlanguage {German}{ghyph31}{}{2}{2}   %% further such lines
% %may be used;
%%% Previous section is  E X A M P L E   O N L Y

%%% No changes may be made beyond this point.

\uselanguage {USenglish} %% This MUST be the last line of the file.

• In language.dat file add:
  Georgian loadhyph-ka.tex

• Do "Refresh FNDB"

• Update formats: initexmf --dump5

```

After this system must know about Georgian hyphenation.

2 The First Steps

After package installation user can write documents in Georgian. For this can be used any plain text editor, but there are L^AT_EX suitable Integrated Developing Environment (IDE) Editors , such as Texmaker www.xmlmath.net/texmaker/, TexStudio texstudio.sourceforge.net, texniccenter <http://www.texniccenter.org/>, winedt <http://www.winedt.com/>.⁶

Note, that Georgian input text must be in utf-8 encoding.

There are three basic classes in L^AT_EX : Article , Report , book. Minimal document has a following form:

```

\documentclass[a4paper]{article}
\usepackage[T1,T2A,T8K,T8M]{fontenc} %use English,
                                     %Russian, Georgian fonts
\usepackage[utf8]{inputenc} %Text Encoding
\usepackage[english,russian,georgian]{babel} %Document's
                                             %language is Georgian

```

⁵ *fmtutil - all,fmtutil - sys* in Linux/Unix

⁶This document is created in TexStudio editor.

```
\begin{document}
Document text
\end{document}
```

For languages based on Georgian script (Megruli,Laz,Chan,Svan), which use umlauts and accents we can use T_EXfunctions. Fox example:

ს ა ჳ ბ ბ ბ ბ ბ ბ ბ ბ ბ ბ

Because of Georgian script don't fit in one encoding, two encodings T8M and T8K-Asomtavruli-Mkhedruli and Khucuri-Mkhedruli are introduced⁷.If we turn on amsmat *amsmat* package, We can have following text: ბ, ბუ^ბ.

The *babel* package knows about Georgian and the most therms are translated. *babel* loads T8K , and then T8M encoding definition files. This means, that main encoding of the document will be T8M (Asomtavruli-Mkhedruli). If user needs to have basic encoding T8K (Nuskhuri-Mkhedruli), than in document's preamble must have

```
\usepackage[english,georgian]{babel}
\usepackage[T8M,T8K]{fontenc}
```

In such document text can be in Nuskhuri-Mkhedruli script without any additional command and for Asomtavruli script user needs:

```
\mrglovani
მაგალითად
{\mrglovani ასომთავრული ტექსტი ႠႡႢႣႤႥႧႨ }
```

which gives: ႠႡႢႣႤႥႧႨ

If document's encoding is T8M, than before Nuskhuri-Mkhedruli script we need:

```
{\khucuri ხუცური ტექსტი ႡႢႣႤႥ ႧႨႩႪႫႬႭႮႯႰႱႲႳႴႵႶႷႸႹႺႻႼႽႾႿႿႿ }
```

Which gives: ႡႢႣႤႥ ႧႨႩႪႫႬႭႮႯႰႱႲႳႴႵႶႷႸႹႺႻႼႽႾႿႿႿ

This is necessary, because Nuskhuri and Asomtavruli are defined in different encodings.

3 Text indexing

T_EX uses *makeidx* and it works for Georgian scripts, but output file is in T_EX's internal representation(in therms of macro commands) not in utf-8 and hard to read. For UNICODE texts is the best suited *xindy* package and works for Georgian scripts, but it is not available for *MikTeX* distribution. But we can use *index* and *idxlayout* packages to have nice output. Add in the preamble:

```
\usepackage{index}
\usepackage[columns=3,totoc=true]{idxlayout}
\newcommand{\Index}[1]{\index{#1}#1}
\makeindex
\renewindex{default}{idx}{ind}{საძიებელი}
```

⁷see . kaencodings.pdf for detailes

In this way we can index words in the document on following way `\index{სიტყვა}`. To add index page in the document one can use `\printindex` in place of desired output of index page. But this is not enough. After indexing document do:

```
makeindex.exe "filename".idx
```

filename.idx is created after Build command User can also pass the style file (for example. *latex.ist*) and after this we need to rebuild document again.

4 Nomenclature (Definition of therms and symbols)

Add in the preamble:

```
\usepackage{nomenc1}  
\makenomenclature  
\renewcommand\nomname{აღნიშვნები}
```

After file compilation do

```
makeindex <filename>.nlo -s nomencl.ist -o <filename>.nls
```

and rebuild file again. Of course there need to be `\printnomenclature` in the document, where you need nomenclature to be printed.

5 Additional information

L^AT_EX can be widely used for technical and natural science texts as well as for humanitarian sciences. The best way to learn L^AT_EX is to use it. For source of this document and other questions you might have to use Georgian in L^AT_EX pleas visit GeoT_EX site <http://tex.tsu.ge>