

# `smglom.cls/sty`: Semantic Multilingual Glossary for Math

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## Abstract

The `smglom` package is part of the  $\text{\LaTeX}$  collection, a version of  $\text{\TeX}/\text{\LaTeX}$  that allows to markup  $\text{\TeX}/\text{\LaTeX}$  documents semantically without leaving the document format, essentially turning  $\text{\TeX}/\text{\LaTeX}$  into a document format for mathematical knowledge management (MKM).

This package supplies an infrastructure for writing OMDoc glossary entries.

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## **1 Introduction**

## **2 The User Interface**

### **2.1 Package and Class Options**

`smglom.cls` accepts all options of the `omdoc.cls` and `article.cls` and just passes them on to these.

### 3 Implementation: The SMGloM Class

The general preamble for L<sup>A</sup>T<sub>E</sub>XML(class and package)

```
1 <*ltxml.cls | ltxml.sty>
2 # -*- CPERL -*-
3 package LaTeXML::Package::Pool;
4 use strict;
5 use warnings;
6 use LaTeXML::Package;
7 </ltxml.cls | ltxml.sty>
```

#### 3.1 Class Options

To initialize the `smglom` class, we pass on all options to `omdoc.cls` as well as the `stex` and `smglom` packages.

```
8 <*cls>
9 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{omdoc}
10                                     \PassOptionsToPackage{\CurrentOption}{stex}
11                                     \PassOptionsToPackage{\CurrentOption}{smglom}}
12 \ProcessOptions
13 </cls>
14 <*ltxml.cls>
15 \DeclareOption(undef,sub {PassOptions('omdoc','cls', ToString(Digest(T_CS('\CurrentOption'))));
16                                     PassOptions('stex', 'sty', ToString(Digest(T_CS('C
17                                     PassOptions('smglom','sty',ToString(Digest(T_CS('Curr
18 \ProcessOptions();
19 </ltxml.cls>
```

We load `omdoc.cls`, the `smglom` package that provides the SMGloM-specific functionality<sup>1</sup>, and the `stex` package to allow OMDoc compatibility.

```
20 <*cls>
21 \LoadClass{omdoc}
22 \RequirePackage{smglom}
23 \RequirePackage{stex}
24 \RequirePackage{amstext}
25 \RequirePackage{amsfonts}
26 </cls>
27 <*ltxml.cls>
28 \LoadClass('omdoc');
29 \RequirePackage('stex');
30 \RequirePackage('smglom');
31 \RequirePackage('amstext');
32 \RequirePackage('amsfonts');
33 </ltxml.cls>
```

Now we do the same thing for the package; first the options, which we just pass on to the `stex` package.

---

<sup>1</sup>EdNOTE: MK:describe that above

```

34 <*sty>
35 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{modules}}
36 \ProcessOptions
37 </sty>
38 <*ltxml.sty>
39 DeclareOption(undef,sub {PassOptions('modules','sty',ToString(Digest(T_CS('\CurrentOption'))));
40 ProcessOptions();
41 </ltxml.sty>

```

We load `omdoc.cls`, and the desired packages. For the  $\text{\LaTeX}$ ML bindings, we make sure the right packages are loaded.

```

42 <*sty>
43 \RequirePackage{modules-mh}
44 \RequirePackage[langfiles]{smultiling-mh}
45 </sty>
46 <*ltxml.sty>
47 RequirePackage('modules');
48 RequirePackage('smultiling',options => ['langfiles']);
49 </ltxml.sty>

```

### 3.2 For Module Definitions

`\gimport` Just a shortcut, we have a starred and unstarred version, the first one is conservative. For example, if we execute:

```
\gimport[smglom/numberfields]{naturalnumbers}
```

First we are redirected to `\@gimport@nostar`, we store the `smglom/numberfields` (*the repo's path*) in `\@test`, then store `\mh@currentrepos` (*current directory*) in `\mh@repos`. If no repo's path is offered, that means the module to import is under the same directory, so we let `repos=\mh@repos` and pass bunch of parameters to `\importmhmodule`, which is defined in `module.sty`. If there's a repo's path, then we let `repos=(the repo's path)`. Finally we use `\mhcurrentrepos` (defined in `module.sty`) to change the `\mh@currentrepos`.

```

50 <*sty>
51 \def\gimport{\@ifstar\@gimport@star\@gimport@nostar}%
52 \newrobustcmd\@gimport@star[2][]{%
53   \def\@test{#1}%
54   \edef\mh@repos{\mh@currentrepos}%
55   \ifx\@test\@empty%
56     \importmhmodule[conservative,repos=\mh@repos,ext=tex,path=#2]{#2}%
57   \else%
58     \importmhmodule[conservative,repos=#1,ext=tex,path=#2]{#2}%
59   \fi%
60   \mhcurrentrepos{\mh@repos}%
61   \ignorespaces%
62 }%

```

```

63 \newrobustcmd\gimport@nostar[2][]{%
64   \def\@test{#1}%
65   \edef\mh@@repos{\mh@currentrepos}%
66   \ifx\@test\@empty%
67     \importmhmodule[repos=\mh@@repos,ext=tex,path=#2]{#2}%
68   \else%
69     \importmhmodule[repos=#1,ext=tex,path=#2]{#2}%
70   \fi%
71   \mhcurrentrepos{\mh@@repos}%
72   \ignorespaces%
73 }%
74 \</sty>
75 \<*lxml.sty>
76 DefMacro('gimport', ' \ifstar\gimport@star\gimport@nostar');
77 DefMacro('gimport@star[]{}', 'gimport[conservative=true,ext=tex,path=#2]{#1}{#2}');
78 DefMacro('gimport@nostar[]{}', 'gimport[conservative=false,ext=tex,path=#2]{#1}{#2}');
79 DefConstructor('gimport OptionalKeyVals:importmhmodule {}{}',
80   "<omdoc:imports "
81   . "from='?&GetKeyVal(#1,'load')(&canonical_omdoc_path(&GetKeyVal(#1,'load')))(###2' "
82   . "conservative='&GetKeyVal(#1,'conservative'))'>",
83   afterDigest => \&gimportI);

```

To make this work we need a sub that sets the respective values.

```

84 sub gimportI {
85   my ($stomach,$whatsit) = @_;
86   my $keyval = $whatsit->getArg(1);
87   my $repos = ToString($whatsit->getArg(2));
88   my $name = $whatsit->getArg(3);
89   if ($repos) {
90     $keyval->setValue('repos',$repos); }
91   else {
92     $keyval->setValue('repos',LookupValue('current_repos')); }
93   # Mystery: Why does $whatsit->setArgs($keyval,$name) raise a warning for
94   # "odd numbers" in hash assignment? Workaround for now!
95   $$whatsit{args}[1] = $name; # Intention: $whatsit->setArg(2,$name);
96   undef $$whatsit{args}[2]; # Intention: $whatsit->deleteArg(3);
97   importMHmoduleI($stomach,$whatsit);
98   return; }##$
99 \</lxml.sty>

```

guse just a shortcut

```

100 \<*sty>
101 \newrobustcmd\guse[2][]{%
102   \def\@test{#1}%
103   \edef\mh@@repos{\mh@currentrepos}%
104   \ifx\@test\@empty%
105     \usemhmodule[repos=\mh@@repos,ext=tex,path=#2]{#2}%
106   \else%
107     \usemhmodule[repos=#1,ext=tex,path=#2]{#2}%
108   \fi%

```

```

109 \mhcurrentrepos{\mh@@repos}%
110 \ignorespaces%
111 }%
112 \</sty>
113 \<*ltxml.sty>
114 DefMacro('guse[]{}', 'g@use[ext=tex,path=#2]{#1}{#2}');
115 DefConstructor('g@use OptionalKeyVals:importmhmodule {} {}',
116 " <omdoc:uses from='?'&GetKeyVal(#1,'load')(&canonical_omdoc_path(&GetKeyVal(#1,'load')))(###2
117 afterDigest => \&gimportI);
118 \</ltxml.sty>

gadopt just a shortcut
119 \<*sty>
120 \newrobustcmd\gadopt[2][]{%
121 \def\@test{#1}%
122 \edef\mh@@repos{\mh@currentrepos}%
123 \ifx\@test\@empty%
124 \adoptmhmodule[repos=\mh@@repos,ext=tex,path=#2]{#2}%
125 \else%
126 \adoptmhmodule[repos=#1,ext=tex,path=#2]{#2}%
127 \fi%
128 \mhcurrentrepos{\mh@@repos}%
129 \ignorespaces%
130 }%
131 \</sty>
132 \<*ltxml.sty>
133 DefMacro('gadopt[]{}', 'g@adopt[ext=tex,path=#2]{#1}{#2}');
134 DefConstructor('g@adopt OptionalKeyVals:importmhmodule {} {}',
135 " <omdoc:adopts from='?'&GetKeyVal(#1,'load')(&canonical_omdoc_path(&GetKeyVal(#1,'load')))(##
136 afterDigest => \&gimportI);
137 \</ltxml.sty>

*nym
138 \<*sty>
139 \newrobustcmd\hypernym[3][]{\if@importing\else\par\noindent #2 is a hypernym of #3\fi}%
140 \newrobustcmd\hyponym[3][]{\if@importing\else\par\noindent #2 is a hyponym of #3\fi}%
141 \newrobustcmd\meronym[3][]{\if@importing\else\par\noindent #2 is a meronym of #3\fi}%
142 \</sty>
143 \<*ltxml.sty>
144 DefConstructor('hypernym [] {}{}', "");
145 DefConstructor('hyponym [] {}{}', "");
146 DefConstructor('meronym [] {}{}', "");
147 \</ltxml.sty>

```

EdN:2

\MSC to define the Math Subject Classification,<sup>2</sup>

```

148 \<*sty>
149 \newrobustcmd\MSC[1]{\if@importing\else MSC: #1\fi}%
150 \</sty>

```

---

<sup>2</sup>EdNOTE: MK: what to do for the LaTeXML side?

```

151 <*ltxml.sty>
152 DefConstructor('MSC{}','');
153 </ltxml.sty>

```

### 3.3 For Language Bindings

Here we adapt the `smultiling` functionality to the special situation, where the module and file names are identical by design.

**gviewsig** The `gviewsig` environment is just a layer over the `viewsig` environment with the keys suitably adapted.

```

154 <ltxml.sty>RawTeX(
155 <*sty | ltxml.sty>
156 \newenvironment{gviewsig}[4][]{%
157   \def\test{#1}%
158   \ifx\@test\@empty%
159     \begin{mhviewsig}[frompath=#3,topath=#4]{#2}{#3}{#4}%
160   \else%
161     \begin{mhviewsig}[frompath=#3,topath=#4,#1]{#2}{#3}{#4}%
162   \fi%
163 }{%
164   \end{mhviewsig}%
165 }%

```

**gviewnl** The `gve` environment is just a layer over the `viewnl` environment with the keys suitably adapted.

```

166 \newenvironment{gviewnl}[5][]{%
167   \def\@test{#1}\ifx\@test\@empty%
168     \begin{mhviewnl}[frompath=#4,topath=#5]{#2}{#3}{#4}{#5}%
169   \else%
170     \begin{mhviewnl}[#1,frompath=#4,topath=#5]{#2}{#3}{#4}{#5}%
171   \fi%
172 }{%
173   \end{mhviewnl}%
174 }%
175 </sty | ltxml.sty>
176 <ltxml.sty>');

```

### 3.4 Authoring States

We add a key to the module environment.

```

177 <*sty>
178 \addmetakey{module}{state}%
179 </sty>
180 <*ltxml.sty>
181 DefKeyVal('modnl','state','Semiverbatim');
182 </ltxml.sty>

```

### 3.5 Shadowing of repositories

**\repos@macro** **\repos@macro** parses a GitLab repository name  $\langle group \rangle / \langle name \rangle$  and creates an internal macro name from that, which will be used

```

183 <*sty>
184 \def\repos@macro#1/#2;{#1@shadows@#2}%

```

**\shadow** **\shadow** $\{\langle orig \rangle\}\{\langle fork \rangle\}$  declares a that the private repository  $\langle fork \rangle$  shadows the MathHub repository  $\langle orig \rangle$ . Internally, it simply defines an internal macro with the shadowing information.

```

185 \def\shadow#1#2{\@namedef{\repos@macro#1;}{#2}}%
186 </sty>
187 <*ltxml.sty>
188 DefConstructor('shadow{ }', '');
189 </ltxml.sty>

```

**\MathHubPath** **\MathHubPath** $\{\langle repos \rangle\}$  computes the path of the fork that shadows the MathHub repository  $\langle repos \rangle$  according to the current **\shadow** specification. The computed path can be used for loading modules from the private version of  $\langle repos \rangle$ .

```

190 <*sty>
191 \def\MathHubPath#1{\@ifundefined{\repos@macro#1;}{#1}\@nameuse{\repos@macro#1;}}%
192 </sty>
193 <*ltxml.sty>
194 DefConstructor('\MathHubPath{ }', '');
195 </ltxml.sty>

```

and finally, we need to terminate the file with a success mark for perl.

```

196 <ltxml.sty | ltxml.cls>1;

```