

# pathsuris.sty: Paths and URIs for $\text{\LaTeX}$ \*

Jinbo Zhang, Michael Kohlhase, Dennis Müller  
FAU Erlangen-Nürnberg

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## Abstract

This package provides macros to deal with paths and base URIs for  $\text{\LaTeX}$ . In particular, it offers a path canonicalizer, which is used in package `modules`, in order to support modules specified with relative path.

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# 1 User Interface

## 1.1 Base URIs

`\baseURI` `\baseURI`<sup>1</sup>

## 1.2 Using Absolute Paths

Finally, the separation of documents into multiple modules often profits from a symbolic management of file paths. To simplify this, the `modules` package supplies the `\defpath` macro: `\defpath[⟨baseURI⟩]{⟨cname⟩}{⟨path⟩}` defines a command, so that `\⟨cname⟩{⟨name⟩}` expands to `⟨path⟩/⟨name⟩`. So we could have used

```
\defpath{OPaths}{../other}
\importmodule[load=\OPahts{bar}]{bar}
```

instead of the second line in Example ???. The variant `\OPaths` has the big advantage that we can get around the fact that `TEX/LATEX` does not set the current directory in `\input`, so that we can use systematically deployed `\defpath`-defined path macros to make modules relocatable by defining the path macros locally. The optional parameter `⟨baseURI⟩` is for the L<sup>A</sup>T<sub>E</sub>X<sub>ML</sub> transformation, which (if `⟨baseURI⟩` is specified) resolves `⟨path⟩` to an absolute URI according to [BFM05, section 5.2].

## 1.3 Path Canonicalization

By calling `\@cpath{⟨path⟩}`, the canonicalized path will be stored in `\@CanPath`.  
`\cpath` To print a canonicalized path, simply use `\cpath{⟨path⟩}`. Here is a set of examples with their canonizalized paths for testing.

path	canonicalized path	expected
aaa	aaa	aaa
../../aaa	../../aaa	../../aaa
aaa/bbb	aaa/bbb	aaa/bbb
aaa/..		
../../aaa/bbb	../../aaa/bbb	../../aaa/bbb
../aaa/..bbb	../bbb	../bbb
../aaa/bbb	../aaa/bbb	../aaa/bbb
aaa/bbb/..ddd	aaa/ddd	aaa/ddd
aaa/bbb/./ddd	aaa/bbb/ddd	aaa/bbb/ddd
./		
aaa/bbb/../..		

<sup>1</sup>EDNOTE: document it

## 1.4 URIs

By calling `\seturi[\meta{macroname}]{\langle path \rangle}`, the URI will be split into its components `\macronamescheme`, `\macronameauthority`, `\macronamepath`, `\macronamequery` and `\macronamefragment`, and the resolved URI itself is stored in `\macronameuri`, as in the following example. If the optional `macroname` is not provided, the default name is `pathsuris@curruri@`.

In order to differentiate between empty and missing components, a missing component will be equal to `\makeuri@empty`, whose *expansion* is `\relax`.

`\seturi[myuri]{http://this.isatest/foo/bar/?query#fragment}`

	macro	value
yields:	<code>\myuriuri</code>	http://this.isatest/foo/bar?query#fragment
	<code>\myurischeme</code>	http
	<code>\myuriauthority</code>	this.isatest
	<code>\myuripath</code>	foo/bar
	<code>\myuriquery</code>	query
	<code>\myurifragment</code>	fragment

`\makeuri{\meta{scheme}}{\meta{authority}}{\meta{path}}{\meta{query}}{\meta{fragment}}` constructs a URI from its individual components. The (expanded and resolved) individual components will be stored in `\makeuri@scheme`, `\makeuri@authority`, etc.; the resolved URI will be stored in `\makeuri@uri`.

`\asuri{\meta{macroname}}{\meta{uri}}`, similarly to `setpath`, defines a new macro `\macroname[\meta{newmacroname}]{\meta{command}}` that allows manipulating `uri` in various ways. `\asuri` calls `\seturi[\meta{macroname}]{\meta{uri}}`, so the individual components and full `uri` (as string) are subsequently stored in `\macronamescheme`, `\macronameauthority`, etc.

If an optional new macro name is given in `\macroname`, then the result of the modification is stored in that new macro, as if defined via `\asuri`; otherwise, the macro is modified “in place”.

- `\macroname{drop query}` drops the query component.
- `\macroname{drop fragment}` drops the fragment component.
- `\macroname{/other/path}` drops query and fragment, appends `other/path` to the path and resolves the URI.
- `\macroname{?newquery}` drops the fragment and either declares `newquery` as a new query component, or appends `?newquery` to the existing query component, if it is not `\makeuri@empty`. Note, that this behaviour diverges from the official URI specification, but it conforms to MMT URI’s, which use `?` as separator between `DPaths`, modules names and declaration names.
- `\macroname{#newfragment}` analogously to `{?newquery}`.

## 2 The Implementation

```

1 \langle *package\rangle
2 \RequirePackage{stex-base}
3 \RequirePackage{xstring}
4 \RequirePackage{etoolbox}

```

### 2.1 Base URIs

`\baseURI` On the L<sup>A</sup>T<sub>E</sub>X side we do nothing (for the moment).

```

5 \newcommand\baseURI[2] [] {}

```

### 2.2 Using Absolute Paths

`\defpath` `\defpath[optional argument]{macro name}{base path}` defines a new macro which can take another path to form one integrated path. For example, `\MathHub` in every `localpaths.tex` is defined as:

```

\defpath{MathHub}{/path/to/localmh/MathHub}

```

then we can use `\MathHub` to form other paths, for example,

```

\MathHub{source/smgglom/sets}

```

will generate `/path/to/localmh/MathHub/source/smgglom/sets`.

```

6 \newrobustcmd\defpath[3] [] {%
7   \expandafter\newcommand\csname #2\endcsname[1] {#3/##1}%
8 }%

```

### 2.3 Path Canonicalization

We define two macros for changing the category codes of common characters in URIs, in particular `#`.

```

9 \def\pathsuris@setcatcodes{%
10   \edef\pathsuris@oldcatcode@hash{\the\catcode'\#}%
11   \catcode'\#=12\relax%
12   \edef\pathsuris@oldcatcode@slash{\the\catcode'\/%}
13   \catcode'\/=12\relax%
14   \edef\pathsuris@oldcatcode@colon{\the\catcode'\:%}
15   \catcode'\:=12\relax%
16   \edef\pathsuris@oldcatcode@qm{\the\catcode'\?}%
17   \catcode'\?=12\relax%
18 }
19 \def\pathsuris@resetcatcodes{%
20   \catcode'\#\pathsuris@oldcatcode@hash\relax%
21   \catcode'\/>\pathsuris@oldcatcode@slash\relax%
22   \catcode'\:\pathsuris@oldcatcode@colon\relax%
23   \catcode'\?\pathsuris@oldcatcode@qm\relax%
24 }

```

We define some macros for later comparison.

```

25 \def\@ToTop{..}
26 \def\@Slash{/}
27 \def\@Colon{:}
28 \def\@QuestionMark{?}
29 \def\@Dot{.}
30
31 \pathsuris@setcatcodes
32 \def\@Fragment{#}
33 \pathsuris@resetcatcodes

```

Implement \@cpath.

\@cpath

```

34 \def\@cpath#1{%
35   \edef\pathsuris@cpath@temp{#1}%
36   \def\@CanPath{}%
37   \IfBeginWith\pathsuris@cpath@temp\@Slash{%
38     \@cpath@loop%
39     \edef\@CanPath{\@Slash\@CanPath}%
40   }{%
41     \IfBeginWith\pathsuris@cpath@temp\@Dot\@Slash{%
42       \StrGobbleLeft\pathsuris@cpath@temp2[\pathsuris@cpath@temp]%
43       \@cpath@loop%
44     }{%
45       \ifx\pathsuris@cpath@temp\@Dot\else%
46       \@cpath@loop\fi%
47     }%
48   }%
49   \IfEndWith\@CanPath\@Slash{%
50     \ifx\@CanPath\@Slash\else%
51     \StrGobbleRight\@CanPath1[\@CanPath]%
52     \fi%
53   }{}%
54 }
55
56 \def\@cpath@loop{%
57   \IfSubStr\pathsuris@cpath@temp\@Slash{%
58     \StrCut\pathsuris@cpath@temp\@Slash\pathsuris@cpath@temp@a\pathsuris@cpath@temp%
59     \ifx\pathsuris@cpath@temp@a\@ToTop%
60       \ifx\@CanPath\empty%
61         \edef\@CanPath{\@ToTop}%
62       \else%
63         \edef\@CanPath{\@CanPath\@Slash\@ToTop}%
64       \fi%
65       \@cpath@loop%
66     \else%
67     \ifx\pathsuris@cpath@temp@a\@Dot%
68       \@cpath@loop%
69     \else%

```

```

70      \IfBeginWith\pathsuris@cpath@temp\@ToTop{%
71          \StrBehind{\pathsuris@cpath@temp}{\@ToTop}[\pathsuris@cpath@temp]%
72          \IfBeginWith\pathsuris@cpath@temp\@Slash{%
73              \edef\pathsuris@cpath@temp{\@CanPath\pathsuris@cpath@temp}%
74          }{%
75              \ifx\@CanPath\@empty\else%
76                  \edef\pathsuris@cpath@temp{\@CanPath\@Slash\pathsuris@cpath@temp}
77              \fi%
78          }%
79          \def\@CanPath{}%
80          \@cpath@loop%
81      }{%
82          \ifx\@CanPath\@empty%
83              \edef\@CanPath{\pathsuris@cpath@temp@a}%
84          \else%
85              \edef\@CanPath{\@CanPath\@Slash\pathsuris@cpath@temp@a}%
86          \fi%
87          \@cpath@loop
88      }%
89      \fi\fi%
90  }{
91      \ifx\@CanPath\@empty%
92          \edef\@CanPath{\pathsuris@cpath@temp}%
93      \else%
94          \edef\@CanPath{\@CanPath\@Slash\pathsuris@cpath@temp}%
95      \fi%
96  }%
97 }

```

Implement `\cpath` to print the canonicalized path.

`\cpath`

```

98 \newcommand\cpath[1]{%
99     \@cpath{#1}%
100     \@CanPath%
101 }

```

## 2.4 URIs

Various macros for dealing with URIs. To deal with empty URI components (scheme, authority, etc.), we use `\relax` to signify a non-existent component as opposed to an empty one.

```

102 \def\makeuri@setempty#1{\def#1{\relax}}
103 \def\makeuri@empty{\relax}
104 \def\makeuri@test#1{%
105     \ifx#1\makeuri@empty\else#1\fi%
106 }

```

`\makeuri` `\makeuri` constructs a URI from scheme, authority, path, query and fragment separately.

```

107 \def\makeuri@uri{}
108 \def\makeuri#1#2#3#4#5{
109     \edef\makeuri@scheme{#1}
110     \edef\makeuri@authority{#2}
111     \edef\makeuri@path{#3}
112     \ifx\makeuri@path\makeuri@empty\else
113         \@cpath{#3}
114         \edef\makeuri@path{\@CanPath}
115     \fi
116     \edef\makeuri@query{#4}
117     \edef\makeuri@fragment{#5}
118     \ifx\makeuri@scheme\makeuri@empty\else
119         \edef\makeuri@scheme{\makeuri@scheme\@Colon}
120     \fi
121     \ifx\makeuri@authority\makeuri@empty\else
122         \edef\makeuri@authority{\@Slash\@Slash\makeuri@authority}
123         \ifx\makeuri@path\makeuri@empty\else
124             \IfBeginWith\makeuri@path\@Slash{{
125                 \edef\makeuri@path{\@Slash\makeuri@path}
126             }}
127         \fi
128     \fi
129     \ifx\makeuri@query\makeuri@empty\else
130         \edef\makeuri@query{\@QuestionMark\makeuri@query}
131     \fi
132     \ifx\makeuri@fragment\makeuri@empty\else
133         \edef\makeuri@fragment{\@Fragment\makeuri@fragment}
134     \fi
135     \edef\makeuri@uri{%
136         \makeuri@test\makeuri@scheme%
137         \makeuri@test\makeuri@authority%
138         \makeuri@test\makeuri@path%
139         \makeuri@test\makeuri@query%
140         \makeuri@test\makeuri@fragment%
141     }
142 }

```

\seturi@

```

143 \newif\if@pathsuris@done@
144 \def\seturi@[#1]#2{%
145     \@pathsuris@done@false%
146     \def\pathsuris@prefix@temp{#1}
147     \edef\pathsuris@curruri{#2}%
148     \edef\pathsuris@curruri{\expandafter\detokenize\expandafter{\pathsuris@curruri}}
149     \let\pathsuris@temp\pathsuris@curruri%
150     \makeuri@setempty\pathsuris@curruri@scheme%
151     \makeuri@setempty\pathsuris@curruri@authority%
152     \makeuri@setempty\pathsuris@curruri@path%
153     \makeuri@setempty\pathsuris@curruri@query%
154     \makeuri@setempty\pathsuris@curruri@fragment%

```

```

155 % scheme
156 \IfSubStr{\pathsuris@temp}{\@Colon}{%
157 % TODO check for valid scheme
158 \StrBefore{\pathsuris@temp}{\@Colon}[\pathsuris@curruri@scheme]%
159 \StrBehind{\pathsuris@temp}{\@Colon}[\pathsuris@temp]%
160 }{}%
161 % authority
162 \IfBeginWith{\pathsuris@temp}{\@Slash\@Slash}{%
163 \StrBehind{\pathsuris@temp}{\@Slash\@Slash}[\pathsuris@temp]%
164 \IfSubStr{\pathsuris@temp}{\@Slash}{%
165 \StrBefore{\pathsuris@temp}{\@Slash}[\pathsuris@curruri@authority]%
166 \StrBehind{\pathsuris@temp}{\@Slash}[\pathsuris@temp]%
167 % TODO userinfo,host,port
168 }{%
169 \IfSubStr\pathsuris@temp\@QuestionMark{
170 \StrBefore{\pathsuris@temp}{\@QuestionMark}[\pathsuris@curruri@authority]%
171 \StrBehind{\pathsuris@temp}{\@QuestionMark}[\pathsuris@temp]%
172 \edef\pathsuris@temp{\@QuestionMark\pathsuris@temp}%
173 }{
174 \IfSubStr\pathsuris@temp\@Fragment{
175 \StrBefore{\pathsuris@temp}{\@Fragment}[\pathsuris@curruri@authority]%
176 \StrBehind{\pathsuris@temp}{\@Fragment}[\pathsuris@temp]%
177 \edef\pathsuris@temp{\@Fragment\pathsuris@temp}%
178 }{
179 \edef\pathsuris@curruri@authority{\pathsuris@temp}%
180 \@pathsuris@done@true%
181 }
182 }
183 }%
184 }{}%
185 % path, query, fragment
186 \if@pathsuris@done@else%
187 \IfSubStr{\pathsuris@temp}{\@QuestionMark}{%
188 % path
189 \StrBefore{\pathsuris@temp}{\@QuestionMark}[\pathsuris@curruri@path]%
190 \@cpath\pathsuris@curruri@path%
191 \edef\pathsuris@curruri@path{\@CanPath}%
192 \StrBehind{\pathsuris@temp}{\@QuestionMark}[\pathsuris@temp]%
193 % query, fragment
194 \IfSubStr{\pathsuris@temp}{\@Fragment}{%
195 \StrBefore{\pathsuris@temp}{\@Fragment}[\pathsuris@curruri@query]%
196 \StrBehind{\pathsuris@temp}{\@Fragment}[\pathsuris@curruri@fragment]%
197 }{%
198 \edef\pathsuris@curruri@query{\pathsuris@temp}%
199 }%
200 }{%
201 % path, fragment
202 \IfSubStr{\pathsuris@temp}{\@Fragment}{%
203 \StrBefore{\pathsuris@temp}{\@Fragment}[\pathsuris@curruri@path]%
204 \@cpath\pathsuris@curruri@path%

```



```

205             \edef\pathsuris@curruri@path{\@CanPath}%
206             \StrBehind{\pathsuris@temp}{\@Fragment}{\pathsuris@curruri@fragment}%
207         }{%
208             \edef\pathsuris@curruri@path{\pathsuris@temp}%
209         }%
210     }%
211 \fi%
212 \makeuri\pathsuris@curruri@scheme\pathsuris@curruri@author\pathsuris@curruri@path\pathsuris@curruri@query\pathsuris@curruri@fragment\pathsuris@curruri@uri
213 \let\pathsuris@curruri@uri\makeuri@uri
214 %drop trailing slash of path
215 %\IfEndWith{\pathsuris@curruri@path}{\@Slash}{%
216 %    \StrGobbleRight{\pathsuris@curruri@path}{1}{\pathsuris@curruri@path}
217 %}%}%
218 %
219 %\edef\pathsuris@curruri@path{\cpath{\pathsuris@curruri@path}}%
220 \ifx\pathsuris@prefix@temp\empty\else%
221     \expandafter\let\csname \pathsuris@prefix@temp scheme\endcsname\pathsuris@curruri@scheme%
222     \expandafter\let\csname \pathsuris@prefix@temp authority\endcsname\pathsuris@curruri@author%
223     \expandafter\let\csname \pathsuris@prefix@temp path\endcsname\pathsuris@curruri@path%
224     \expandafter\let\csname \pathsuris@prefix@temp query\endcsname\pathsuris@curruri@query%
225     \expandafter\let\csname \pathsuris@prefix@temp fragment\endcsname\pathsuris@curruri@fragment%
226     \expandafter\let\csname \pathsuris@prefix@temp uri\endcsname\pathsuris@curruri@uri%
227 \fi%
228 }

\seturi
229 \newrobustcmd\seturi[1][{}]{%
230     \pathsuris@setcatcodes%
231     \expandafter\pathsuris@resetcatcodes\seturi@[#1]%
232 }

\asuri \asuri{macroname}{uri} generates \macroname[optional new macro name]{action},
that allows for modifying uri in various ways.

233
234 \def\asuri#1{%
235     \pathsuris@setcatcodes%
236     \expandafter\pathsuris@resetcatcodes\asuri@[#1]%
237 }
238
239 \def\@asuri[#1]#2{
240     \@cpath{#2}
241     \expandafter\def\csname #1\endcsname{
242         \expandafter\edef\csname #1uri\endcsname{\@CanPath}
243         \seturi[#1]{\@CanPath}
244         \expandafter\renewcommand\csname #1\endcsname[1][{}]{%
245             \pathsuris@setcatcodes%
246             \@asuri@[##1]{#1}%
247         }%
248 }

```

```

249
250 \protected\def\@asuri@[#1]#2#3{
251     \pathsuris@resetcatcodes
252     \@asuri@[#1]{#2}{#3}
253 }
254
255 \newif\if@asuri@changed@
256 \protected\def\@asuri@[#1]#2#3{
257     \@asuri@changed@false
258     \edef\@asuri@command{#3}
259     \trimstring\@asuri@command
260     \IfBeginWith\@asuri@command{drop}{
261         \StrBehind{\@asuri@command}{drop}[\@asuri@command]
262         \trimstring\@asuri@command
263         \IfStrEq\@asuri@command{query}{
264             \makeuri{\csname #2scheme\endcsname}%
265                 {\csname #2authority\endcsname}%
266                 {\csname #2path\endcsname}%
267                 \makeuri@empty%
268                 {\csname #2fragment\endcsname}%
269             \@asuri@changed@true
270         }{
271             \IfStrEq\@asuri@command{fragment}{
272                 \makeuri{\csname #2scheme\endcsname}%
273                     {\csname #2authority\endcsname}%
274                     {\csname #2path\endcsname}%
275                     {\csname #2query\endcsname}%
276                 \makeuri@empty%
277                 \@asuri@changed@true
278             }{
279                 \IfStrEq\@asuri@command{extension}{
280                     \edef\@asuri@oldpath{\csname #2path\endcsname}
281                     \StrCount\@asuri@oldpath.[\@asuri@lastdot]
282                     \ifnum\@asuri@lastdot>0
283                         \StrBehind[\@asuri@lastdot]\@asuri@oldpath.[\@asuri@extension]
284                         \IfSubStr\@asuri@extension\@Slash{{
285                             \StrBefore[\@asuri@lastdot]\@asuri@oldpath.[\@asuri@oldpath]
286                         }
287                     \fi
288                     \makeuri{\csname #2scheme\endcsname}%
289                         {\csname #2authority\endcsname}%
290                         \@asuri@oldpath%
291                         \makeuri@empty%
292                         \makeuri@empty%
293                     \@asuri@changed@true
294                 }{}}{
295             }{
296                 \IfBeginWith\@asuri@command{\@Slash}{
297                     \@cpath{\csname #2path\endcsname\@asuri@command}
298                     \makeuri{\csname #2scheme\endcsname}%

```

```

299         {\csname #2authority\endcsname}%
300         {\@CanPath}%
301         \makeuri@empty%
302         \makeuri@empty%
303         \@asuri@changed@true
304     }{
305     \IfBeginWith\@asuri@command{\@QuestionMark}{
306         \expandafter\ifx\csname #2query\endcsname\makeuri@empty
307             \StrBehind\@asuri@command\@QuestionMark[\@asuri@command]
308             \edef\@asuri@nquery{\@asuri@command}
309         \else
310             \edef\@asuri@nquery{\csname #2query\endcsname\@asuri@command}
311         \fi
312         \makeuri{\csname #2scheme\endcsname}%
313             {\csname #2authority\endcsname}%
314             {\csname #2path\endcsname}%
315             {\@asuri@nquery}%
316         \makeuri@empty%
317         \@asuri@changed@true
318     }{
319     \IfBeginWith\@asuri@command{\@Fragment}{
320         \expandafter\ifx\csname #2fragment\endcsname\makeuri@empty
321             \StrBehind\@asuri@command\@Fragment[\@asuri@command]
322             \edef\@asuri@nfrag{\@asuri@command}
323         \else
324             \edef\@asuri@nfrag{\csname #2fragment\endcsname\@asuri@command}
325         \fi
326         \makeuri{\csname #2scheme\endcsname}%
327             {\csname #2authority\endcsname}%
328             {\csname #2path\endcsname}%
329             {\csname #2query\endcsname}%
330             {\@asuri@nfrag}%
331         \@asuri@changed@true
332     }{}
333     }}
334     \edef\@asuri@ncs{#1}
335     \if@asuri@changed@
336         \ifx\@asuri@ncs\@empty
337             \asuri{#2}\makeuri@uri
338         \else
339             \asuri\@asuri@ncs\makeuri@uri
340         \fi
341     \fi
342 }
343

```

auxiliary code:

```

344
345 </package>

```

## Change History

v1.0

General: First Version with  
Documentation ..... 1

v1.1

General: adding `\baseURI` from  
`omdoc.sty` and `\defpath` from  
`modules.sty` ..... 1

## References

- [BFM05] Tim Berners-Lee, Roy T. Fielding, and Larry Masinter. *Uniform Resource Identifier (URI): Generic Syntax*. RFC 3986. Internet Engineering Task Force (IETF), 2005. URL: <http://www.ietf.org/rfc/rfc3986.txt>.