The bib2qr package

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Abstract

The bib2qr package provides functionality to cite BibTeX entries with QR codes for easy sharing and referencing. The target of the QR code is the entry's digital object identifier (DOI), or URL if no DOI exists. It is realised in the `\qrcite` macro, via the LaTeX packages biblatex and qrcode. In addition to the `\qrcite` command, the package contains the `\qrfullcite` macro, which requires only a BibTeX key as argument and allows to generate output that might look as follows:

Christian Schreinemachers (July 31, 2024). *bib2qr - A LaTeX package for citing BibTeX entries with QR codes.* Version v0.2. URL: https://codeberg.org/Cs137/bib2qr/releases/tag/v0.2

Contents

1 Introduction

I like to include quick-response (QR) codes of references on slides created with LaTeX beamer. Previously, I did this by using the qrcode package and manually declaring the URL of the reference's digital object identifier (DOI). Occasionally, I also add human-readable information generated via `\fullcite` from the biblatex package.

To avoid manually declaring the URL and calling two separate commands for QR codes and human-readable citations, I developed this LaTeX package. It automates

*bib2qr v0.2 (source code)

the inclusion of QR codes by a biblatex bibliography driver[1], which uses field formats to display QR codes for the entry's `doi` and `url` fields with the qrcode package. You can cite any reference from your bibliography with this driver by declaring its ⟨*key*⟩ to the `\qrcite` command. The latter is a cite command[2], which ensures that any referenced QR code is also listed in the reference list.

For the inclusion of both, QR codes and human-readable citation information in a single step, I introduced the `\qrfullcite` command. It applies the `\qrcite` command and the `\fullcite` command from the biblatex package, ensuring clarity and ease of reference not only on beamer slides, but in any LaTeX document.

2 Usage

Load the package in your document's preamble and specify any of the options described in the next subsection as follows:

`\usepackage[`⟨*option(s)*⟩`]{bib2qr}`

2.1 Options

In order to change the default behaviour of this package, declare one or more of the options described in this subsection with your desired value.

`doiurlbase=`⟨***string***⟩ (default: `https://doi.org/`) specifies the prefix to convert a DOI string into its URL. If the DOI string starts with ⟨*doiurlbase*⟩, it is used as is to generate a QR code. Otherwise, the DOI string is appended to ⟨*doiurlbase*⟩ to form the DOI's URL, which is then used to generate the QR code. In normal use cases this option does not require any adjustment.

`qrdelimiter=`⟨***sepcode***⟩ (default: `\space`) specifies the delimiter of QR codes generated by `\qrcite` in multicite mode. It is shown between the individual QR codes of multiple references created by `\qrcite{`⟨*key1,key2,...keyN*⟩`}` and *"...is arbitrary code to be executed after each iteration..."*[2]. The examples shown in this document were generated considering the default `qrdelimiter`.

`qrversion=`⟨***version specification***⟩ (default: `0`) sets the version of the QR code. Consult the qrcode documentation for details about the ⟨*version specification*⟩[3]. The examples shown in this document were generated considering the default `qrversion`.

`qrwidth=`⟨***dimen***⟩ (default: `2cm`) sets the width of the QR code. The value is used to determine the width for the output of the `\fullcite` macro and is passed to qrcode as `height` option. The default value is quite suitable for usage in LaTeX beamer slides, but in such documents as this one, a smaller width might be desired. The examples shown in this document were generated using `qrwidth=1.25cm`.

[1] biblatex documentation p. 166 (v3.20)
[2] biblatex documentation p. 186 (v3.20)
[3] qrcode documentation p. 3 (v1.51)

2.2 Macros

`\qrcite{⟨key(s)⟩}`

`\qrcite` QR code(s) with a link to the reference's DOI or URL can be generated using the `\qrcite` command. The target of the QR code is the entry's DOI converted into a URL, or the URL iteself. In case the BibTeX entry has no DOI and no URL, it does nothing besides raising a warning. The output for some example entries is shown underneath. If you would like to replicate the examples, you can find the entries sources as appendix A.1. The colours are defined in the examples, as this functionality is out of scope of the package bib2qr. Moreover, hyperlink is configured in such a way that the links in the following examples consider the font colour, usually links would be presented in the colour defined as `linkcolor`.

The example displayed in blue was created via `\qrcite{bib2qr}`. The QR code in red next to it was generated via `\qrcite{Doe2024}`. The entry of the latter has a DOI, while the entry of the blue example represents a BibTeX entry without a DOI, but there is a value assigned to its URL field. The macro `\qrcite` is a cite command, thus it can be used to cite multiple references, as shown in black (`\qrcite{bib2qr,Doe2024}`), and entries cited via `\qrcite` are included in the document's bibliography (cf. appendix A.2).

`\qrfullcite{⟨key⟩}`

`\qrfullcite` This command displays the QR code of a BibTeX entry's DOI link or URL and a full citation. The QR code is generated by `\qrcite` and the full citation by `\fullcite`, provided by the package biblatex. Each output is presented in individual minipages which are placed next to each other, as shown in the examples underneath (`\qrfullcite{bib2qr}`, `\qrfullcite[noindent]{Doe2024}`).

Please note that `\qrfullcite` does **not** support group citations and accepts only a single ⟨*key*⟩ as argument.

Christian Schreinemachers (July 31, 2024). *bib2qr - A LaTeX package for citing BibTeX entries with QR codes*. Version v0.2. URL: `https://codeberg.org/Cs137/bib2qr/releases/tag/v0.2`

Jane Doe (2024). "A comprehensive study on example generation". In: *Journal of Examples* 42, pp. 1982–2024. DOI: `10.1234/example.2024.001`

The output of `\qrfullcite` is considered as its own paragraph, thus it may be indented, like in this document (see blue example). You can prevent the latter by providing the `noindent` option when calling the macro, as done in the red example.

The first minipage has the width of the package option `qrwidth` and displays the output of `\qrcite{⟨key⟩}`. The second minipage occupies the remaining width of `\linewidth` considering a gap of `0.5em` and `\parindent`, if the latter is not deactivated via the `noindent` option. It shows the output of `\fullcite{⟨key⟩}`.

2.3 Hints

If the hyperref package is loaded, not only the DOI/URL strings, but also the QR codes are presented as links. It was modified in this document to allow you to distinguish the output of the individual macro calls in a better way. The previous example without any modifications of the document settings and without deactivating the indentation looks as follows:

Jane Doe (2024). "A comprehensive study on example generation". In: *Journal of Examples* 42, pp. 1982–2024. DOI: 10.1234/example.2024.001

2.4 Known limitations

In case no QR code can be generated by `\qrcite` called via `\qrfullcite`, the output of `\fullcite` is nevertheless indented by the width assigned to the `qrwidth` package option and the length of the gap of `0.5em`), as shown in orange below (`\qrcite{Mustermann2023}`).

> Erika Mustermann (2023). "Limitations in including electronic references in articles". In: *Journal of Examples* 23, pp. 624–666

3 Implementation

3.1 Dependencies

In order to use bib2qr, the LaTeX packages biblatex, ifthen, qrcode, and xstring are required as package dependencies.

```
\RequirePackage{biblatex}
\RequirePackage{ifthen}
\RequirePackage{qrcode}
\RequirePackage{xstring}
```

3.2 Options

The package options are internally available as `\@bibiiqr@`⟨*option*⟩.

```
\DeclareKeys[@bibiiqr]{
  doiurlbase.store = \@bibiiqr@doiurlbase,
  doiurlbase.usage = load,
  qrdelimiter.store = \@bibiiqr@qrdelimiter,
  qrdelimiter.usage = load,
  qrversion.store = \@bibiiqr@qrversion,
  qrversion.usage = load,
  qrwidth.store = \@bibiiqr@qrwidth,
  qrwidth.usage = load,
}%
```

Assignement of default values

```
\SetKeys[@bibiiqr]{
  doiurlbase=https://doi.org/,
  qrdelimiter=\space,
```

```
18   qrversion=0,
19   qrwidth=2cm,
20 }%
```

Processing of package options

```
21 \ProcessKeyOptions[@bibiiqr]\relax
```

3.3 Macros

`\@bibiiqr@showqr` `{`⟨*string*⟩`}`
Display a string as QR code considering the package options `qrversion` and `qrwidth`.

```
22 \newcommand\@bibiiqr@showqr[1]{%
23   \qrcode[height=\@bibiiqr@qrwidth,version=\@bibiiqr@qrversion]{#1}%
24 }%
```

3.3.1 Field formats

Custom field formats are defined to display a QR code of an entry's `doi` and `url`.

`@bibiiqr@fldFmtDoi` Field format to display a DOI field's value (converted into an URL considering the option `@bibiiqr@doiurlbase`) as QR code using macro `\@bibiiqr@showqr`.

```
25 \DeclareFieldFormat{@bibiiqr@fldFmtDoi}{%
26   \IfBeginWith{#1}{\@bibiiqr@doiurlbase}%
27     {\@bibiiqr@showqr{#1}}%
28     {\@bibiiqr@showqr{\@bibiiqr@doiurlbase#1}}%
29 }%
```

`@bibiiqr@fldFmtUrl` Field format to display an URL field's value as QR code using `\@bibiiqr@showqr`.

```
30 \DeclareFieldFormat{@bibiiqr@fldFmtUrl}{\@bibiiqr@showqr{#1}}
```

3.3.2 Bibliography driver

`@bibiiqr@bibDrvQR` This bibliography driver allows to display the QR code of an entry's DOI-, or URL field. It applies the `\printfield[`⟨*format*⟩`]{`⟨*field*⟩`}` macro, which is provided by the biblatex package to displpay a QR code using the `@bibiiqr@fldFmtDoi` or `@bibiiqr@fldFmtUrl` field format and the corresponding field, respectively.

The DOI is preferred and the URL is only used if no value is assigned to the DOI field. If neither the DOI, nor the URL field contains a value, a package warning is raised.

```
31 \DeclareBibliographyDriver{@bibiiqr@bibDrvQR}{%
32   \usebibmacro{begentry}%
33   \ifboolexpr{test{\iffieldundef{doi}}}
34     {%
35       \ifboolexpr{test{\iffieldundef{url}}}%
```

The entry has no DOI and no URL: Raise a warning.

```
36       {%
37         \PackageWarning{bib2qr}%
38           {BibTeX entry without DOI or URL: \thefield{entrykey}}{}%
39       }%
```

The entry has no DOI but an URL: Display the `url` field's value using the `@bibiiqr@fldFmtUrl` field format.

```
      {\printfield[@bibiiqr@fldFmtUrl]{url}}%
    }%
```

The entry has a DOI: Display the `doi` field's value using the `@bibiiqr@fldFmtDoi` field format.

```
    {\printfield[@bibiiqr@fldFmtDoi]{doi}}%
  \usebibmacro{finentry}%
}
```

3.3.3 Author commands

`\qrcite` `{`⟨*key(s)*⟩`}`

Display the QR code of a BibTeX entry's DOI link or URL by introducing the cite command `\qrcite{`⟨*key*⟩`}`, which makes use of the previously defined bibliography driver `@bibiiqr@bibDrvQR`. It requires at least one BibTeX `{`⟨*key*⟩`}` as argument.

```
\DeclareCiteCommand{\qrcite}
  {\usebibmacro{prenote}}%
  {\usedriver{}{@bibiiqr@bibDrvQR}}%
  {\@bibiiqr@qrdelimiter}%
  {\usebibmacro{postnote}}%
```

`\qrfullcite` `[`⟨*option(s)*⟩`]{`⟨*key*⟩`}`

Display the QR code of a singe BibTeX entry's DOI link or URL and a full citation of it. Specify `noindent` as option, if the output should not be indented.

```
\NewDocumentCommand{\qrfullcite}{O{}m}{%
  \par%
  \ifthenelse{\equal{#1}{noindent}}{%
    \noindent%
    \edef\@bibiiqr@mpiiwidth{\dimexpr\linewidth-\@bibiiqr@qrwidth-0.5em}%
  }{%
    \edef\@bibiiqr@mpiiwidth{%
      \dimexpr\linewidth-\parindent-\@bibiiqr@qrwidth-0.5em}%
  }%
  \begin{minipage}[t]{\@bibiiqr@qrwidth}
    \qrcite{#2}%
  \end{minipage}
  \hspace{0.5em}%
  \begin{minipage}{\@bibiiqr@mpiiwidth}
    \fullcite{#2}%
  \end{minipage}
  \par%
}%
```

4 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

5 Change History

The changes listed in this section aim to provide a brief overview of the changes introduced into the package bib2qr. The package repository on Codeberg contains a changelog file, consult it to read a detailed description of the changes introduced into this package.

A Appendix

The examples presented in this document are based on the BibTeX entries listed in A.1 and result in the bibliography shown as A.2 (biblatex options: `style=authoryear`, `sorting=none`).

A.1 Example BibTeX entries

```
@software{bib2qr,
  author  = {Schreinemachers, Christian},
  title   = {bib2qr - A LaTeX package for citing BibTeX entries with QR codes},
  url     = {https://codeberg.org/Cs137/bib2qr/releases/tag/v0.2},
  version = {v0.2},
  date    = {2024-07-31}
}
@article{Doe2024,
  author  = {Doe, Jane},
  title   = {A comprehensive study on example generation},
  journal = {Journal of Examples},
  year    = {2024},
  volume  = {42},
  pages   = {1982--2024},
  doi     = {10.1234/example.2024.001}
}
@article{Mustermann2023,
  author  = {Mustermann, Erika},
  title   = {Limitations in including electronic references in articles},
  journal = {Journal of Examples},
  year    = {2023},
  volume  = {23},
  pages   = {624--666}
}
```

A.2 Example bibliography

Schreinemachers, Christian (July 31, 2024). *bib2qr - A LaTeX package for citing BibTeX entries with QR codes*. Version v0.2. URL: https://codeberg.org/Cs137/bib2qr/releases/tag/v0.2.

Doe, Jane (2024). "A comprehensive study on example generation". In: *Journal of Examples* 42, pp. 1982–2024. DOI: 10.1234/example.2024.001.

Mustermann, Erika (2023). "Limitations in including electronic references in articles". In: *Journal of Examples* 23, pp. 624–666.