sphinxcontrib-katex

Release 0.7.2

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Apr 28, 2021

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CHAPTER 1

Installation

To install `sphinxcontrib.katex` into your Python virtual environment run:

```
$ pip install sphinxcontrib-katex
```

If you want to pre-render the math by running Javascript on your server instead of running it in the browsers of the users, you have to install `katex` on your server and add it to your path:

```
$ npm install katex
$ PATH="${PATH}:$(pwd)/node_modules/.bin"
```

CHAPTER 2

Usage

In `conf.py` of your Sphinx project, add the extension with:

```
extensions = ['sphinxcontrib.katex']
```

For enable server side pre-rendering add in addition:

```
katex_prerender = True
```

See the Configuration section for all availble settings.

CHAPTER 3

Configuration

The behavior of `sphinxcontrib.katex` can be changed by configuration entries in `conf.py` of your documentation project. In the following all configuration entries are listed and their default values are shown.

```
katex_css_path = \
    'https://cdn.jsdelivr.net/npm/katex@0.12.0/dist/katex.min.css'
katex_js_path = \
    'https://cdn.jsdelivr.net/npm/katex@0.12.0/dist/katex.min.js'
katex_autorender_path = \
    'https://cdn.jsdelivr.net/npm/katex@0.12.0/contrib/auto-render.min.js'
katex_inline = [r'\(', r'\)']
katex_display = [r'\[', r'\]']
katex_prerender = False
katex_options = ''
```

The specific delimiters written to HTML when math mode is encountered are controlled by the two lists `katex_inline` and `katex_display`.

If `katex_prerender` is set to `True` the equations will be pre-rendered on the server and loading of the page in the browser will be faster. On your server you must have a `katex` executable installed and in your PATH as described in the Installation section.

The string variable `katex_options` allows you to change all available official KaTeX rendering options, e.g.

```
katex_options = r'''{
    displayMode: true,
    macros: {
        "\\RR": "\\mathbb{R}"
    }
}'''
```

You can also add KaTeX auto-rendering options to `katex_options`, but be aware that the `delimiters` entry should contain the entries of `katex_inline` and `katex_display`.

CHAPTER 4

LaTeX Macros

Most probably you want to add some of your LaTeX math commands for the rendering. In KaTeX this is supported by LaTeX macros (`\def`). You can use the `katex_options` configuration setting to add those:

```
katex_options = r'''macros: {
        "\\i": "\\mathrm{i}",
        "\\e": "\\mathrm{e}^{#1}",
        "\\vec": "\\mathbf{#1}",
        "\\x": "\\vec{x}",
        "\\d": "\\operatorname{d}\\!{}",
        "\\dirac": "\\operatorname{\\delta}\\left(#1\\right)",
        "\\scalarprod": "\\left\\langle#1,#2\\right\\rangle",
    }'''
```

The disadvantage of this option is that those macros will be only available in the HTML based Sphinx builders. If you want to use them in the LaTeX based builders as well you have to add them as the `latex_macros` setting in your `conf.py` and specify them using proper LaTeX syntax. Afterwards you can include them via the `sphinxcontrib.katex.latex_defs_to_katex_macros` function into `katex_options` and add them to the LaTeX preamble:

```
import sphinxcontrib.katex as katex

latex_macros = r"""
    \def \i                {\mathrm{i}}
    \def \e              #1{\mathrm{e}^{#1}}
    \def \vec            #1{\mathbf{#1}}
    \def \x                {\vec{x}}
    \def \d                {\operatorname{d}\!}
    \def \dirac          #1{\operatorname{\delta}\left(#1\right)}
    \def \scalarprod   #1#2{\left\langle#1,#2\right\rangle}
"""

# Translate LaTeX macros to KaTeX and add to options for HTML builder
katex_macros = katex.latex_defs_to_katex_macros(latex_macros)
katex_options = 'macros: {' + katex_macros + '}'

# Add LaTeX macros for LATEX builder
latex_elements = {'preamble': latex_macros}
```

CHAPTER 5

Math Rendering Examples

The examples start always with a code box showing the commands, which is followed by the resulting Sphinx output.

5.1 Inline math

```
Some inline math :math:`x_1 + x_2 + ... + x_n, n \in \mathbb{Z}`,
followed by text.
```

Some inline math $x_1 + x_2 + ... + x_n, n \in \mathbb{Z}$, followed by text.

5.2 Macros

You can define macros directly in your math directive.

```
.. math::

    \def \x {\mathbf{x}}
    \def \w {\omega}
    \def \d {\operatorname{d}\!}

    P(\x,\w) = \oint_{\partial V} D(\x_0,\w) G(\x-\x_0,\w) \d A(\x_0)
```

$$P(\mathbf{x},\omega) = \oint_{\partial V} D(\mathbf{x}_0,\omega)G(\mathbf{x}-\mathbf{x}_0,\omega)\,\mathrm{d}A(\mathbf{x}_0)$$

If you want to use them in the whole document, the best is to define them in `conf.py` as part of the `katex_options`, see *LaTeX Macros*. Afterwards, you can use them in every math directive.

5.3 Aligned environment

```
.. math::

    \begin{aligned}
        \dot{x} & = \sigma(y-x) \\
        \dot{y} & = \rho x - y - xz \\
        \dot{z} & = -\beta z + xy
    \end{aligned}
```

$$\begin{aligned}
\dot{x} & = \sigma(y-x) \\
\dot{y} & = \rho x - y - xz \\
\dot{z} & = -\beta z + xy
\end{aligned}$$

5.4 Array environment

```
.. math::

    \begin{array}{c:c:c:c:c:c}
        \Gamma & \Delta & \Theta & \Lambda & \Xi & \Pi \\ \hdashline
        \gamma & \delta & \theta & \lambda & \xi & \pi
    \end{array}
```

$$\begin{array}{c:c:c:c:c:c}
\Gamma & \Delta & \Theta & \Lambda & \Xi & \Pi \\ \hdashline
\gamma & \delta & \theta & \lambda & \xi & \pi
\end{array}$$

5.5 Case definitions

```
.. math::

    f(n) = \begin{cases}
        \frac{n}{2}, & \text{if } n\text{ is even} \\
        3n+1,        & \text{if } n\text{ is odd}
    \end{cases}
```

$$f(n) = \begin{cases}
\frac{n}{2}, & \text{if } n\text{ is even} \\
3n+1, & \text{if } n\text{ is odd}
\end{cases}$$

5.6 Matrices

A simple matrix defined with the `pmatrix` environment:

```
.. math::

    \begin{pmatrix}
        a_{11} & a_{12} & a_{13}\\
        a_{21} & a_{22} & a_{23}\\
        a_{31} & a_{32} & a_{33}
    \end{pmatrix}
```

$$\begin{pmatrix}
a_{11} & a_{12} & a_{13}\\
a_{21} & a_{22} & a_{23}\\
a_{31} & a_{32} & a_{33}
\end{pmatrix}$$

The `pmatrix*` environment is not available, but you can use the `array` environment for more complex matrices:

```
.. math::

    \def \msum {-\textstyle\sum}
    \def \psum {\phantom{-}\textstyle\sum}
    I_{ik} = \left(
    \begin{array}{lll}
        \psum m (y^2+z^2) & \msum m x y       & \msum m x z          \\
        \msum m y x       & \psum m (x^2+z^2) & \msum m y z          \\
        \msum m z x       & \msum m z y       & \psum m (x^2 + y^2)
    \end{array}
    \right)
```

$$I_{ik} = \left(\begin{array}{lll} \sum m(y^2+z^2) & -\sum mxy & -\sum mxz \\ -\sum myx & \sum m(x^2+z^2) & -\sum myz \\ -\sum mzx & -\sum mzy & \sum m(x^2+y^2) \end{array} \right)$$

5.7 Equation numbers

Some of Maxwell's equations are given in (5.1), (5.2), and (5.3).

```
.. math::
    :label: gauss-law

    \nabla \cdot \mathbf{E} = 4 \pi \rho

.. math::
    :label: gauss-law-magnetism

    \nabla \cdot \mathbf{B} = 0

.. math::
    :label: maxwell-faraday-equation

    \nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}
```

$$\nabla \cdot \mathbf{E} = 4\pi\rho \tag{5.1}$$

$$\nabla \cdot \mathbf{B} = 0 \tag{5.2}$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t} \tag{5.3}$$

5.8 Fraction

```
.. math::
    :label: long-fraction-line

    1 - 2 \phi_{i,j} = \frac{4 N^{AA,aa}_{i,j}
                             + N^{Aa}_{i}
                             + N^{Aa}_{j}
                             - 2 N^{Aa,Aa}_{i,j}}
                            {\sum_{s \in S_{i,j}} 4 p_s (1 - p_s)}
```

$$1 - 2\phi_{i,j} = \frac{4N_{i,j}^{AA,aa} + N_i^{Aa} + N_j^{Aa} - 2N_{i,j}^{Aa,Aa}}{\sum_{s \in S_{i,j}} 4p_s(1-p_s)} \tag{5.4}$$

CHAPTER 6

Contributing

If you find errors, omissions, inconsistencies or other things that need improvement, please create an issue or a pull request at https://github.com/hagenw/sphinxcontrib-katex/. Contributions are always welcome!

6.1 Development Installation

Instead of pip-installing the latest release from PyPI, you should get the newest development version from Github:

```
git clone https://github.com/hagenw/sphinxcontrib-katex.git
cd sphinxcontrib-katex
# Create virtual environment
python setup.py develop
```

This way, your installation always stays up-to-date, even if you pull new changes from the Github repository.

If you prefer, you can also replace the last command with:

```
pip install -e .
```

... where `-e` stands for `--editable`.

6.2 Building the Documentation

If you make changes to the documentation, you can re-create the HTML pages using Sphinx. You can install it and a few other necessary packages with:

```
pip install -r docs/requirements.txt
```

To create the HTML pages, use:

```
python -m sphinx docs/ build/sphinx/ -b html
```

The generated files will be available in the directory `build/sphinx/`.

It is also possible to automatically check if all links are still valid:

```
python -m sphinx docs/ build/sphinx/ -b linkcheck
```

6.3 Running Tests

`sphinxcontrib.katex` is supposed to work for all versions `sphinx>=1.6`. To test that you have to use a stripped down version of the documentation that is provided in the `tests/` folder, as the documentation under `docs/` uses features that are only supported by `sphinx>=1.8`.

To test that everything works as expected, please execute:

```
python -m sphinx tests/ tests/_build/ -c docs/ -b html -W
python -m sphinx tests/ tests/_build/ -c docs/ -b latex -W
```

The same tests are automatically performed by Travis once you create a pull request on Github.

6.4 Creating a New Release

New releases are made using the following steps:

1. Bump version number in `sphinxcontrib/katex.py`
2. Update `NEWS.rst`
3. Commit those changes as "Release x.y.z"
4. Create an (annotated) tag with `git tag -a x.y.z`
5. Clear the `dist/` directory
6. Create a source distribution with `python setup.py sdist`
7. Create a wheel distribution with `python setup.py bdist_wheel --universal`
8. Check that both files have the correct content
9. Upload them to PyPI with twine: `twine upload dist/*`
10. Push the commit and the tag to Github and add release notes containing a link to PyPI and the bullet points from `NEWS.rst`
11. Check that the new release was built correctly on RTD, delete the "stable" version and select the new release as default version

CHAPTER 7

Version History

All notable changes to this project will be documented in this file.

The format is based on Keep a Changelog, and this project adheres to Semantic Versioning.

7.1 Version 0.7.2 (2021-04-28)

- Fixed: Sphinx>=4.0.0 is not supported at the moment

7.2 Version 0.7.1 (2020-10-29)

- Fixed: label of fraction example in docs

7.3 Version 0.7.0 (2020-10-29)

- Added: fraction example to docs
- Changed: switch to KaTeX 0.12.0
- Changed: add small top and bottom padding to equations

7.4 Version 0.6.1 (2020-05-25)

- Fixed: run katex under Windows

7.5 Version 0.6.0 (2020-02-13)

- Changed: switch to Katex 0.11.1
- Changed: add tests for Python 3.7 and 3.8

7.6 Version 0.5.1 (2019-08-13)

- Added: equation numbers in documentation (#16)
- Changed: subset of tests for sphinx<=1.6 (#23)
- Changed: several improvements to documentation

7.7 Version 0.5.0 (2019-07-25)

- Added: katex server side pre-rendering (#15)
- Changed: switch to Katex 0.10.2 (#17)
- Removed: deprecated Sphinx `setup_math` (#10)

7.8 Version 0.4.1 (2019-01-08)

- Fixed: macros example in documentation

7.9 Version 0.4.0 (2018-12-14)

- Added: Sphinx documentation and setup RTD page
- Added: Travis-CI tests
- Changed: KaTeX version 0.10.0
- Changed: make compatible with `sphinx>=1.6`
- Removed: configuration option `katex_version`

7.10 Version 0.3.1 (2018-10-08)

- Fixed: incompatibility with `sphinx>=1.8` (#8)

7.11 Version 0.3.0 (2018-09-06)

- Added: allow for user defined autorendering delimiters (#7)
- Fixed: bug if `katex_options` was blank (#5)

7.12 Version 0.2.0 (2018-06-22)

- Added: document all configuration settings
- Added: automatic setting of delimiters for KaTeX auto-renderer
- Removed: `katex_macros` option

7.13 Version 0.1.6 (2018-04-12)

- Added: equation numbering across pages with `sphinx>=1.7`
- Changed: KaTeX version 0.9.0

7.14 Version 0.1.5 (2017-12-19)

- Added: helper function to convert LaTeX defs to KaTeX macros
- Changed: improvement of code readability
- Fixed: mouse over for equation numbers in Firefox

7.15 Version 0.1.4 (2017-11-27)

- Changed: move equation numbers to the right and center vertically

7.16 Version 0.1 (2017-11-24)

- Added: initial release