

## GammaLib - Feature #829

### GammaLib tutorials and narrative introduction

04/10/2013 04:34 PM - Deil Christoph

<b>Status:</b> Closed	<b>Start date:</b> 04/10/2013
<b>Priority:</b> High	<b>Due date:</b>
<b>Assigned To:</b>	<b>% Done:</b> 0%
<b>Category:</b>	<b>Estimated time:</b> 0.00 hour
<b>Target version:</b> 00-08-00	
<b>Description</b>	
<p>For new users / developers there should be tutorials to get started with gammalib as well as a narrative introduction that explains the major concepts and classes.</p> <p>Currently there are quite nice examples (but not part of a tutorial, with narrative) and there are some PDFs explaining some of the basic gammalib concepts, but this is currently unfinished and a bit hard to find, i.e. not available as html.</p> <p>I have started to write a "Getting started with gammalib" which we had planned to be part of a tutorial on HESS / Fermi data analysis with gammalib / ctools (see attached tarball).</p> <p>But really 90% of the tutorial would not use HESS-private info and I think it would be more useful if it were either part of the gammalib repo itself or a separate gammalib-tutorials repo (because it will contain a lot of images).</p> <p>I find writing RST and sphinx for generating html and PDF very nice for tutorials / narrative docs, certainly better than the hand-written HTML that is used at the moment for the gammalib and ctools web pages / tutorials.</p> <p>Jürgen, what do you think? My suggestion would be we try this out for a few days in a gammalib-tutorials repo on github and if you don't like it we'll remove it?</p>	
<b>Subtasks:</b>	
Action # 838: Create a banner for the sphinx page.	<b>Closed</b>
Action # 840: Convert User Manual to rst.	<b>Closed</b>
Action # 839: Convert coding conventions document to rtf.	<b>Closed</b>

### History

#### #1 - 04/10/2013 05:32 PM - Knödseder Jürgen

I'll have a look.

BTW: I added an examples directory to GammaLib where I started to add some Python scripts. The idea here is to have illustrations of GammaLib usage which makes it easier to start with a own development ...

#### #2 - 04/10/2013 05:48 PM - Deil Christoph

The existing Python examples (in the test and examples folder) are great!  
What is missing is having some explanations and links into the API docs and putting them on a web page so that users find them.

Here's an example of what I think could also work nicely for gammalib and what I'd be happy to help set up / start writing in the next days:

Tutorial: <http://scikit-learn.org/stable/modules/tree.html#classification>

Example: [http://scikit-learn.org/stable/auto\\_examples/tree/plot\\_iris.html#example-tree-plot-iris-py](http://scikit-learn.org/stable/auto_examples/tree/plot_iris.html#example-tree-plot-iris-py)

API: <http://scikit-learn.org/stable/modules/generated/sklearn.tree.DecisionTreeClassifier.html>

In the case of GammaLib the tutorial and examples could be written in RST and processed with Sphinx ... the API would for sure remain Doxygen. The alternative solution is to do everything in Doxygen, but I don't think it's as nice.

**#3 - 04/11/2013 12:10 AM - Knödseder Jürgen**

I checked out your documentation, this looks indeed great! I was looking at some time into technologies for writing documentation, but did not find anything satisfactory. I was at some point thinking of using latex2html (as quite some documentation exists already in Latex), but RST looks also fine.

While reviewing all the method interfaces, I also worked to some extent on the Doxygen documentation and the description of the classes. As example you may check the GModels class. I was thinking of putting such kind of information in for every class, but all these things take just an incredible amount of time.

**#4 - 04/11/2013 01:08 PM - Deil Christoph**

How about I change the existing html website and tutorial to rst and sphinx and once that is in place we discuss what documentation is most needed.

I think having narrative documentation that explains the most important concepts and classes of the API is much more important and a much smaller task than improving and extending the 80,000 lines of existing, already very good compared to most other projects, docstrings.

**#5 - 04/11/2013 08:59 PM - Deil Christoph**

I accidentally branched from master and worked with an old version ... please ignore this comment.

**#6 - 04/11/2013 10:20 PM - Knödseder Jürgen**

Christoph Deil wrote:

How about I change the existing html website and tutorial to rst and sphinx and once that is in place we discuss what documentation is most needed.

Ok

I think having narrative documentation that explains the most important concepts and classes of the API is much more important and a much smaller task than improving and extending the 80,000 lines of existing, already very good compared to most other projects, docstrings.

Sound great.

**#7 - 04/13/2013 09:10 PM - Deil Christoph**

Here's a first version of the sphinx-based docs: <https://github.com/cdeil/gammlib/compare/docs>

I've renamed the doc folder to docs while I was working on the new docs ... we can change this back of course.  
Let me know if you want to merge this and improve it incrementally or if you want me to change things in this branch.

Note that there is a very nice tool to convert back and forth between html, rst, latex and other formats:  
<http://johnmacfarlane.net/pandoc/>

`pandoc something.html -o something.rst`

does 90% of the work and then you just have to clean up a bit.

My suggestion would be that we convert the existing latex documentation in the dev and um folders to rst and include them in the sphinx documentation and then once it's all rst review and restructure the documentation.

There's also quite a bit of documentation on the wiki, some of which should probably be merged and cross-linked with these docs.

One more thing: can you make a smaller logo version and banner ... similar to the one where we took the page layout from : <http://sphinx-doc.org> ?

#### #8 - 04/13/2013 10:08 PM - Knödseder Jürgen

Christoph Deil wrote:

Here's a first version of the sphinx-based docs: <https://github.com/cdeil/gammalib/compare/docs>

Looks good!

I've renamed the doc folder to docs while I was working on the new docs ... we can change this back of course.  
Let me know if you want to merge this and improve it incrementally or if you want me to change things in this branch.

I prefer doc, which is more the standard name (although there is no standard for directory names ; but when I started I made a search of recommendations for directory structures, and doc is the name that is implemented by most packets).

Note that there is a very nice tool to convert back and forth between html, rst, latex and other formats:  
<http://johnmacfarlane.net/pandoc/>

`pandoc something.html -o something.rst`

does 90% of the work and then you just have to clean up a bit.

Great. I was using LaTeX in a first for easy formula typing. Can Sphinx also display formulae in a LaTeX style?

My suggestion would be that we convert the existing latex documentation in the dev and um folders to rst and include them in the sphinx documentation and then once it's all rst review and restructure the documentation.

Good idea, this hopefully helps to get a more living documentation. Needs of course LaTeX embedded as some documents contain quite a bunch of formulae ...

There's also quite a bit of documentation on the wiki, some of which should probably be merged and cross-linked with these docs.

Right, I tend to use the Wiki for the moment as it is more responsive. It's also there for elaborating new concepts, as it can be easily modified. But the idea was indeed to merge the stable Wiki information into the documentation. That's probably better than cross-linking, but we could cross-link to start with ...

One more thing: can you make a smaller logo version and banner ... similar to the one where we took the page layout from : <http://sphinx-doc.org> ?

I'll work on one. Are there some constraints on the size of the banner? Will there also be buttons embedded as on <http://sphinx-doc.org> ?

#### #9 - 04/13/2013 10:15 PM - Knödseder Jürgen

One thing: I guess you need sphinx installed to generate the documentation, right? Do you know if sphinx is a standard package on each Linux distribution?

There is the same problem with Doxygen, but I think that most distros actually have Doxygen.

In any case, the configure script should detect whether sphinx is available or not, and then enable/disable sphinx document generation accordingly (this is done for doxygen). Then we should have:

```
make doxygen <= Builds Doxygen documentation
make sphinx <= Build sphinx documentation
make doc <= Calls make doxygen and make sphinx
```

The Doxygen documentation should be embedded in the sphinx documentation. Do you know whether this is possible?

#### #10 - 04/13/2013 10:29 PM - Deil Christoph

- Sphinx can have math just like LaTeX: <http://sphinx-doc.org/ext/math.html>  
If HTML is generated it can do mathjax (new kid on the block, looks better and less files to generate) or pngmath.  
For PDF it actually generates LaTeX sources and then uses latex.  
Try `make latexpdf`
- Sphinx is available in all repositories as far as I know. For someone that doesn't have root access pip install works.  
90+ % of the time I use the documentation on the web though, so if someone really has problems installing sphinx or doxygen it wouldn't be the end of the world.
- We can copy over the buttons from sphinx-docs if you like them ... but we don't have to.
- For the banner size I would suggest you do something similar as the one on sphinx-docs.org.  
But the layout is completely customisable ... we can make the page look however you like.  
While you're at it, can you also make a 32 x 32 pix favicon for gammalib?  
Here's where you set it in the sphinx conf.py file then:

```
# The name of an image file (within the static path) to use as favicon of the
# docs. This file should be a Windows icon file (.ico) being 16x16 or 32x32
# pixels large.
#html_favicon = None
```

- The way you propose the build to work is very nice. I did write up something slightly different in docs/README.txt, which we should remove or change.
- I don't think the doxygen and sphinx docs can interact a lot. I would simply make the doxygen output a sub-folder in the build/html output folder and then add a hard-coded link back and forth in Doxygen and Sphinx. I haven't tried this yet.

I can work on this some more tomorrow ... can you make sub-tasks and let me know what I should do (e.g. sphinx docs for ctools or convert the latex or some wiki content to rst or ...).

## #11 - 04/13/2013 11:00 PM - Knödlseider Jürgen

- Target version set to 00-08-00

## #12 - 04/13/2013 11:11 PM - Knödlseider Jürgen

- File favicon-bw.png added

- File favicon.jpg added

- File favicon.png added

Christoph Deil wrote:

- Sphinx can have math just like LaTeX: <http://sphinx-doc.org/ext/math.html>  
If HTML is generated it can do mathjax (new kid on the block, looks better and less files to generate) or pngmath.  
For PDF it actually generates LaTeX sources and then uses latex.  
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90+ % of the time I use the documentation on the web though, so if someone really has problems installing sphinx or doxygen it wouldn't be the end of the world.

Right. Was just wondering whether it is a standard thing ...

- We can copy over the buttons from sphinx-docs if you like them ... but we don't have to.

Thats for the cosmetics ... not urgent I guess smile.png

- For the banner size I would suggest you do something similar as the one on sphinx-docs.org.  
But the layout is completely customisable ... we can make the page look however you like.  
While you're at it, can you also make a 32 x 32 pix favicon for gammalib?  
Here's where you set it in the sphinx conf.py file then:  
[...]

In terms of banner, I was thinking of putting the GammaLib icon left, and then just in white characters "GammaLib" (large) and below in smaller white characters "A versatile toolbox for scientific analysis of astronomical gamma-ray data" (both texts to the right of the icon, similar to <http://gammalib.sourceforge.net/> but not on the light blue on the Sphinx background. I fiddled a little around but did not manage to get the things properly aligned.

Attached three 32 x 32 pix favicons. I guess you take the colored png one.

- The way you propose the build to work is very nice. I did write up something slightly different in docs/README.txt, which we should remove or change.

I prefer always the simple style smile.png

- I don't think the doxygen and sphinx docs can interact a lot. I would simply make the doxygen output a sub-folder in the build/html output folder and then add a hard-coded link back and forth in Doxygen and Sphinx. I haven't tried this yet.

Okay, if we can link them it should be okay.

I can work on this some more tomorrow ... can you make sub-tasks and let me know what I should do (e.g. sphinx docs for ctools or convert the latex or some wiki content to rst or ...).

I'll put some together.

### #13 - 04/13/2013 11:20 PM - Knödlseeder Jürgen

I created feature #841 in the ctools project for the same work.

### #14 - 04/15/2013 03:11 PM - Deil Christoph

I've worked on this some more: <https://github.com/cdeil/gammalib/compare/docs2>

- Favicon and banner are now there ... I'm not very versed in html and css, maybe you know how to make the banner fit perfectly?
- Converted user manual and coding conventions to RST.

Things left to do:

- Set up the make sphinx docs as you suggested
- Try to cross-link between the sphinx and doxygen documentation (maybe using absolute links?)
- Convert the other latex documents to RST
- Convert eps figures to png for the html pages
- Include the examples in the sphinx docs
- Move some wiki pages to the docs
- Review and restructure the whole docs: \* what should go onto the top-level page? \* what kind of links should be in the header? \* e.g. installation instructions are present several times. \* there's a lot of info e.g. on some details like GVector, but some of the big picture documentation is missing.

Jürgen, I don't have much time left to work on this before the HESS collaboration meeting next week.

Do you think this could be merged and then the other tasks we will do in the coming months before the 0.8 release?

Can you make a list of things I should still do as part of this PR?

A note on the html and latex conversion to rst: I did

```
pandoc documentation.html -o documentation.rst
pandoc documentation.latex -o documentation.rst
```

and only noticed later that pandoc doesn't handle (i.e. simply drops)

```
\newcommand{\task}{\mbox{GammaLib}}
\newcommand{\this}{\mbox{\tt \task}}
```

and doesn't convert `\ref{}` correctly. The `\newcommands` should be replaced in LaTeX before running pandoc, the `\ref{}` and e.g. tables have to be fixed by hand later or one has to look into pandoc options <http://johnmacfarlane.net/pandoc/>

**#15 - 04/15/2013 06:30 PM - Knödlseider Jürgen**

Thanks for the nice work.

I added the

```
make sphinx  
make doc
```

targets to the Makefile, and

```
make install
```

now also installs the sphinx documentation in the install directory.

I also renamed the build directory to html, as once it's build, it is just the html documentation of the project (if we'd install build, nobody would know what has been built smile.png

I adapted the Readme.txt file to reflect the changes.

Everything merged into devel, so that we can now work incrementally on the documentation.

**#16 - 04/15/2013 06:36 PM - Deil Christoph**

Note that with sphinx you can say `make latexpdf` and that will create by default a latex folder in the build folder. You might have to adapt the paths in `conf.py` to make PDF (or man pages) generation work.

**#17 - 04/15/2013 06:44 PM - Knödlseider Jürgen**

For new users / developers there should be tutorials to get started with `gammalib` as well as a narrative introduction that explains the major concepts and classes.

Currently there are quite nice examples (but not part of a tutorial, with narrative) and there are some PDFs explaining some of the basic `gammalib` concepts, but this is currently unfinished and a bit hard to find, i.e. not available as html.

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But really 90% of the tutorial would not use HESS-private info and I think it would be more useful if it were either part of the `gammalib` repo itself or a separate `gammalib-tutorials` repo (because it will contain a lot of images).

I find writing RST and sphinx for generating html and PDF very nice for tutorials / narrative docs, certainly better than the hand-written HTML that is used at the moment for the `gammalib` and `ctools` web pages / tutorials.

Jürgen, what do you think?

My suggestion would be we try this out for a few days in a `gammalib-tutorials` repo on github and if you don't like it we'll remove it?

**#18 - 04/15/2013 06:45 PM - Knödseder Jürgen**

Christoph Deil wrote:

Note that with sphinx you can say `make latexpdf` and that will create by default a latex folder in the build folder. You might have to adapt the paths in `conf.py` to make PDF (or man pages) generation work.

Great, we should explore this ...

**#19 - 11/18/2013 08:52 PM - Knödseder Jürgen**

- Status changed from New to In Progress

**#20 - 01/19/2014 02:00 AM - Knödseder Jürgen**

- Status changed from In Progress to Closed

**Files**

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docs.tar.gz	212 KB	04/10/2013	Deil Christoph
favicon-bw.png	1.04 KB	04/13/2013	Knödseder Jürgen
favicon.jpg	2.1 KB	04/13/2013	Knödseder Jürgen
favicon.png	1.09 KB	04/13/2013	Knödseder Jürgen