make STEAM clear

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1 Videos

2 Posts

2.1 Set up the TikZ in Emacs Org

An introduction to setup the TikZ environment in Emacs Org File. So that in Org file, you can generate either vector graph of `pdf` format or raster graph of `png` format. Furthermore, you can export the vector graph when latex is called and otherwise raster graph.

2.1.1 config the header args

You can embed TiKz (One of LaTeX graphic package) code into a Org file. With org-babel, you can generate ,insert and export the figure generated from Tikz package. At first, you need set up the environment. This Post serves as a good introduction for beginners. Following it you may have a minimum working example like below:

```
#+name: tutorial
#+header: :file "~/Dropbox/mstemc_hugo/static/img/tikz/tutorial.png"
#+header: :results raw :exports none :fit yes :border 0cm
#+header: :imagemagick t :iminoptions -density 400
#+header: :imoutoptions -geometry 400 -flatten
#+header: :headers '("\\usepackage{tikz} \\usetikzlibrary{positioning,
           shapes.symbols, calc}")
#+begin_src latex
  \begin{tikzpicture}
    \node [circle, draw, fill=red!20] at (0,0) {1}
    child { node [circle, draw, fill=blue!30] {2}
      child { node [circle, draw, fill=green!30] {3} }
      child { node [circle, draw, fill=yellow!30] {4} }};
  \end{tikzpicture}
#+end_src
#+RESULTS: tutorial
[[file:../../img/tikz/tutorial.png]]
```

The example begins with several lines containing `#+header` which is sort of clutter. we can put them in a file and include it at the beginning of the Org file.

2.1.2 generate results with different formats

By changing the extension of `:file` (which is `pdf` for `"../../img/tikz/tutorial.pdf"`), we can generate results with different formats. Now, I need `pdf` and `png` . You can see the result by just press `C-c C-c` in the body of the tikz code.

2.1.3 export the results according to the backend

You can set `:exports` to control how the results will be exported. Now I set it as `none` which means the result will not be exported to latex or other format. I want to set more options of the exports. So I use:

```
#+ATTR_HTML:  :width 800 :align center
#+ATTR_LATEX: :width 0.8\textwidth :align center
{{{if-latex(tutorial.pdf,tutorial.png)}}}
```

`if-latex` is a Org MACRO whose definition is :

```
#+MACRO: if-latex (eval (if
(org-export-derived-backend-p org-export-current-backend 'latex)
 (concat "[[file:../../img/tikz/"  $1 "]]")
 (concat "[[file:../../img/tikz/"  $2 "]]") ))
```

The `if-latex` MACRO let you export different formats by the backend. If the backend is `latex` then, `pdf` format figure will be exported. Otherwise, `png` format figure. Eventually, in the final `pdf` document, you figure can be zoomed in or out without losing any resolution.

2.1.4 the final workflow

The minimum working example at the start of this post is simplifed as below.

```
#+header: :file  "../../img/tikz/tutorial.pdf"
#+begin_src latex
  \begin{tikzpicture}
    \node [circle, draw, fill=red!20] at (0,0) {1}
    child { node [circle, draw, fill=blue!30] {2}
      child { node [circle, draw, fill=green!30] {3} }
      child { node [circle, draw, fill=yellow!30] {4} }};
  \end{tikzpicture}
#+end_src

#+RESULTS:
[[file:../../img/tikz/tutorial.png]]

The following is the generated figure.
#+ATTR_HTML:  :width 800 :align center
#+ATTR_LATEX: :width 0.8\textwidth :align center
{{{if-latex(tutorial.pdf,tutorial.png)}}}
```

Many settings are grouped into a setup file which is included at the top of this post:

```
#+SETUPFILE: ~/.spacemacs.d/org-templates/math-en.org
```

Now, If you set the extension of the target file in the first line either `pdf` or `png` , a corresponding `pdf` or `png` figure will be generated. If execute `M-x org-toggle-inline-images` , you can preview the result. If export the org-file as latex file then the `pdf` file, the image of `pdf` format will be inserted. If export to other format, `png` image will be used.

2.2 Export Markdown and latex using Emacs Org

set up the Emacs org and ox-hugo to export the org files in markdown and latex format.

2.2.1 Introduction

I use hugo before it support Emacs org file. Then I use an Emacs extension called ox-hugo which is a carefully crafted Org exporter back-end for Hugo. Ox-hugo meets all my requirement and definitely worth a try when you are an advanced user of Emacs Org. By the way, if you are quite familiar with Emacs Org, there is no need to take time to learn markdown. Emacs Org, I think, is more elegant than markdown.

2.2.2 set up ox-hugo

I use Spacemacs and integrate ox-hugo into my config is easy. You can add it into your private layer or just add it in your `user-config` . Please refer to the repo. and read the document for more information.

The first time you want to export an Org file or a subtree of an Org file, use `M-x org-hugo-export-to-md` . There will be a hugo-related section in the `org-dispatcher` whenever you use `C-c C-e` .

2.2.3 use Org Macro replacement

Often, you want different actions when you export the Org file to hugo-compatible markdown and latex file. For example, hugo or hugo theme supports summary and shortcodes such as `alert note` and `alert warning` (see Writing content with Markdown, LaTeX, and Shortcodes | Academic)

When you export the snippet to markdown then hugo will display the content according to the css. However, latex does not recognize the shortcodes. So latex will display `{ {% alert note %} }` literally which is clutter. The Org Macro may help. For more information please refer to The Org Manual: Macro replacement and fniessen/org-macros: Shared macros for Org mode . I also define my own Org Macro in my setup file for every .org file. With Org Macro, I control some contents and options exist only for certain backend.

Once you are familiar with Org Macro, It behaves beyond your imagination.

2.2.4 use the setupfile for each Org file

Often, you options for a org file grows more and more. If you think it kind of clutter at the top of your Org files, you can group them in a setupfile then include it at the top of your Org file.

For my setupfiles, please refer to my org-templates. As you can see, I have several setupfiles for different aims. To include one of them in my Org file, I use:

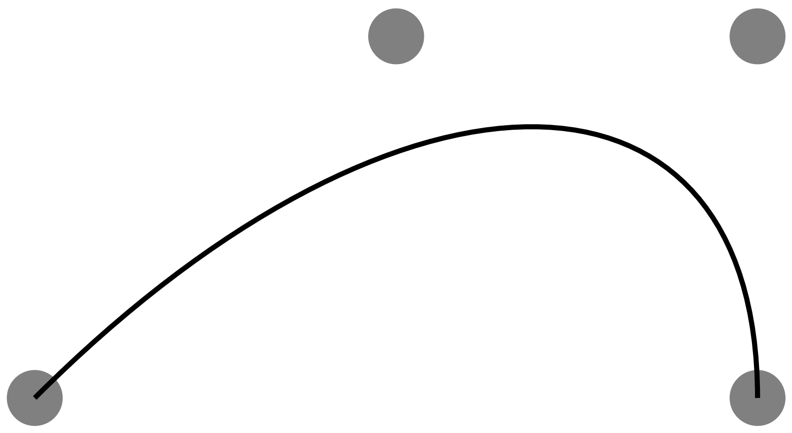
```
#+SETUPFILE: <path+name of the setup files>
```

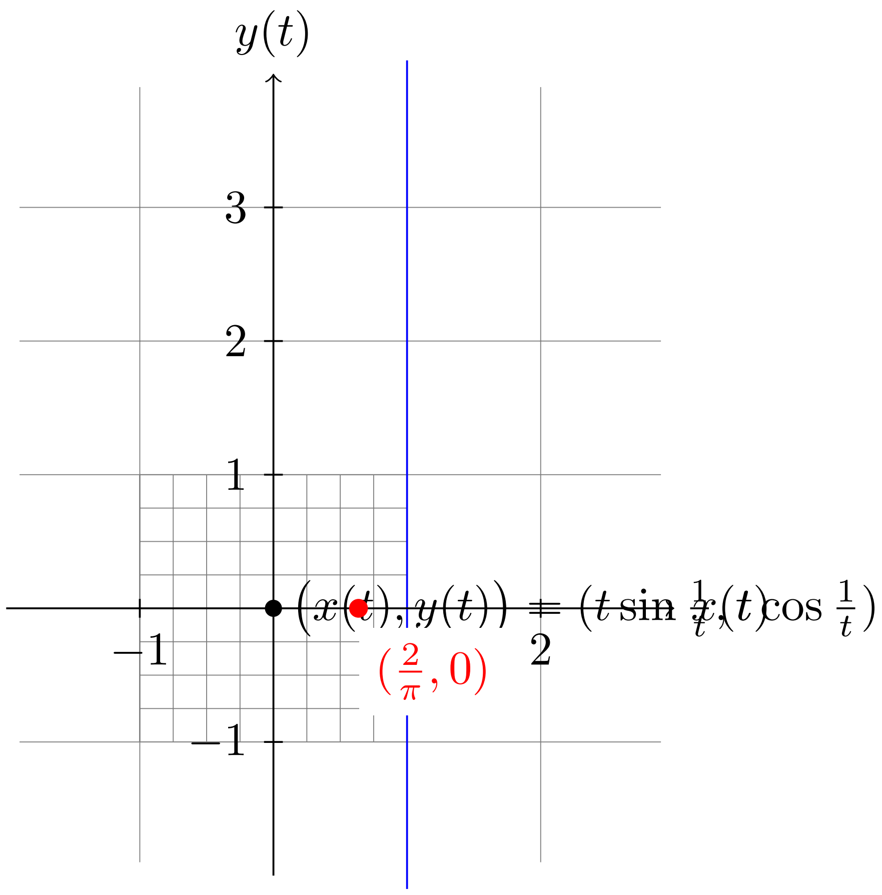
By using `#+SETUPFILE` ,I only have to option lines at the top of my org file. So it looks clean.

Also, you can notice that in my setupfile named enpost.org exists options for different export targets.

2.3 Drawing Graphs Using TikZ in Emacs Org

Draw a graph using TikZ





3 Projects

3.1 my workflow of creating a video

This collection of Videos and Posts describes my workflow of creating a video. Usage of some tools and methods are covered.

During the creation of one video, several tools are tuned to fit my workflow. In this project several videos and posts will be created to make my workflow clear.

Two targets of this project:

1. remind me of the configuration of several tools;
2. show somebody else who may be interested in how I work.

I am not ready to detail each tool. If you are interested in any one of them, please refer to tutorials written by experts or given by the official document.

3.1.1 Emacs

Emacs lies in the center of my workflow. It behaves like a super-IDE which assists me finish almost all the steps. Using Emacs, I program and debug, GTD, write the blogs, export and publish them. Many of the Emacs extensions are awesome. In particular, Emacs Org is the killer app.

How to config Emacs? After more Than ten years of using Emacs, I choose spacemacs. Most beginners can start their work using spacemacs with only a little modifications.

1. program and debug
   I program in python, C/C++, Matlab and some other languages. Emacs acts as a super-IDE for me.
2. Org mode - journalize your work
   Org mode definitely need a standalone subsection.
3. Org mode - get things done
4. Org mode - write a diary
5. Org mode - export your Org file
6. program and debug
7. writing latex
8. org-journal
   I write many notes during a post or a project. Most of my journal is maintained by org-journal: A simple org-mode based journaling mode . And I set the `org-journal-file-type` to `weekly` So that I have around 52 journal file each year.
   The journals can be searched conveniently. Also they can be integrated into Org agenda.
9. ox-hugo
   kaushalmodi/ox-hugo: A carefully crafted Org exporter back-end for Hugo
   Because hugo supports markdown at first (it also supports org file later), I use Emacs Org from the very beginning. I am quite familiar with org-mode, so have no motivation to dig into markdown. Fortunately, ox-hugo meets all my requirement and definitely worth a try when you want to stay in Org.
   Actually, Emacs have extensions to support markdown quite well. However, using Org, I can integrate the org file into my agenda.
10. preview tikz picture in Org
   TikZ and PGF are TEX packages for creating graphics programmatically. TikZ is build on top of PGF and allows you to create sophisticated graphics in a rather intuitive and easy manner.
   You can integrated TikZ code into the Org mode as a source block. I have a not-so-detailed post on how to set up the tikz environment in Org.

3.1.2 Hugo

As the fastest framework for building websites, Hugo shocks me by its speed and flexibility. It is enough to prettify your site using the more than 300+ beautiful themes, from which I am in the mode for Academic theme.

Hugo supports Org file but not so good. Ox-hugo, another extension of Emacs, has my attention. Serving as a bridge between Emacs and Hugo, ox-hugo helps me staying in Emacs Org. There is no need for me to write markdown file if Org is available.

I use ox-hugo as a bridge between Emacs and Hugo. So I do not have to care much about how to leverage Hugo. Ox-hugo helps me do most of the work.

3.1.3 Hugo Academic Theme

Hugo Academic Theme is a beautiful and flexible theme developed for Hugo. This site is built based on this theme.

If you want attach a pdf version of your post, two steps are needed:

1. add a line:
   `url_pdf = "#"`
   in the front matter of your markdown file.
2. add a PDF file with the same name as your posts own folder to your posts folder.

A PDF link will be automatically generated just like the **`pdf`** link appears in the top of each post in my site. Because I use Emacs Org with ox-hugo, I add one line in the property:

```
:EXPORT_HUGO_CUSTOM_FRONT_MATTER+: :url_pdf "#"
```

Hugo academic theme provide some front matters that hugo does not support by default. Fortunately, ox-hugo handles this effectively. For more information. you can read:

1. Org meta-data to Hugo front-matter
2. Custom Front-matter Parameters

3.1.4 manim

3.1.5 blender

4 Courses