`@prism` project

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The `@prism` project [1] provides small size color palettes that can be used to create expressive color maps for graphics in different contexts.

Last changes

1.2.0
2025-10-29

Break.

- Palettes: all final palettes now consist of 10 colors.
- `luadraw` products: the `getPal` dictionary array has been converted into a function accepting string palette names (with or without `pal` prefix). See below.

New.

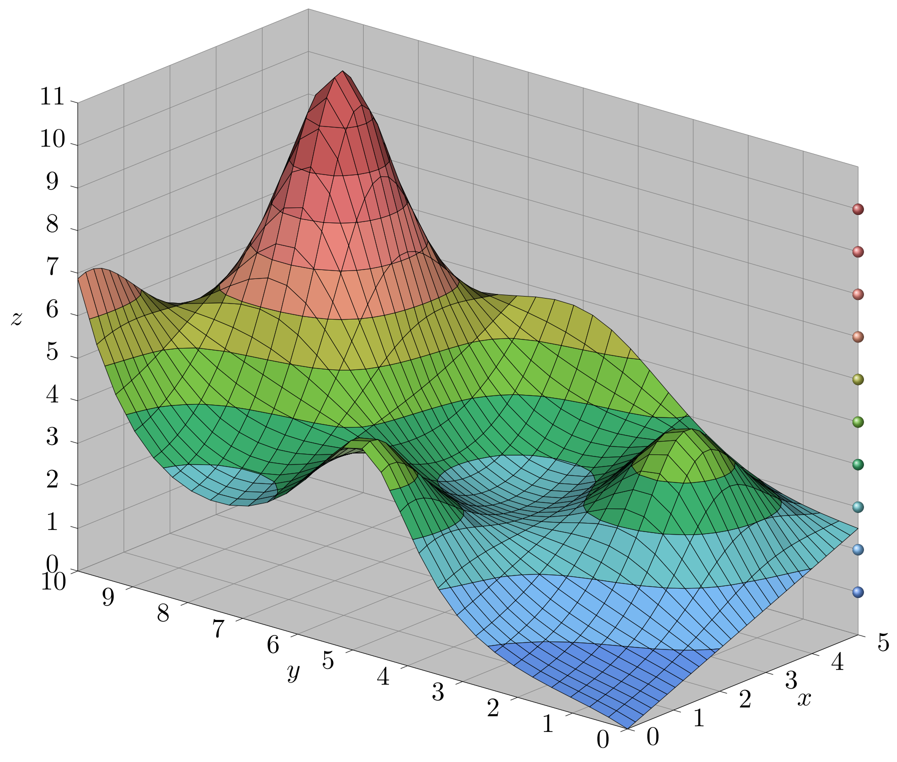
- Palettes.
  - Added `Lemon` and `ShiftRainbow` palettes (`luadraw` creation process used).
  - Added 37 palettes from the `Scientific Coulour Maps` project.
- `luadraw` product: the `getPal` function has an optional argument `options` (dict-like array) with the following keys.
  - `extract`: a list of non-zero integers used to extract specific colors from the palette (the order is preserved).
  - `reverse`: a boolean value indicating whether to reverse the palette color order (`false` by default).
  - `shift`: an integer value for applying a circular color shift to the palette.
- Documentations
  - Added English PDF manual.
  - Showcase: two PDF files demonstrate the use of each palette (white and dark modes).

[1] The name comes from "***`@`*** · ***esthetic*** ***`P`*** · ***roducts*** *for* ***`R`*** · ***epresenting*** ***`I`*** · ***nformative*** ***`S`*** · ***cientific*** ***`M`*** · ***aps***". This name is a double play on words: [1] a prism is where light is split into an informative spectrum, symbolizing how data or visuals are decomposed into meaningful color and style, and [2] where light meets the prism, it breaks down into an informative spectrum ("@" can be read "at").

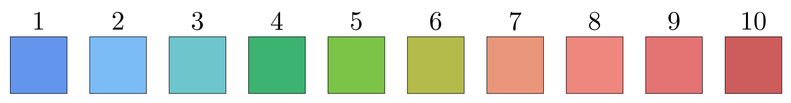
Contents

I. Motivations

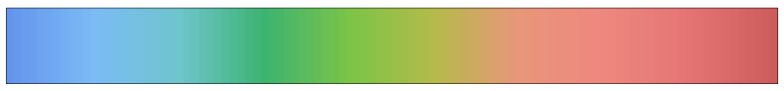
Originally, this project was born out of a desire to enhance `luadraw` with a set of color palettes to easily produce something like the following 3D plot.



Technically, a finite list of colors is provided to `luadraw` which then uses linear interpolation to calculate the intermediate colors. In the previous case, the finite color palette used is defined as follows.

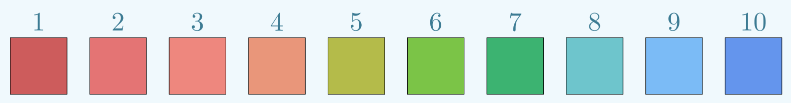


Using this palette, `luadraw` is able to produce the following spectrum, allowing us to create the graph above.

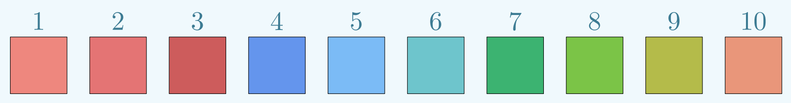


Note.

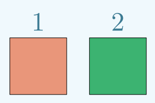
Using the `luadraw` implementation of `@prism`, see the section 2, we can display the palettes below made from the previous one named `'GeoRainbow'`. Each `luadraw` instruction used is given below each palette.



`getPal('GeoRainbow', {reverse = true})`



`getPal('GeoRainbow', {shift = 3})`



`getPal('GeoRainbow', {extract = {7, 15, 4}})`

II. Where do the color palettes come from?

Most of color palettes are obtained from `Matplotlib` and `Scientific Coulour Maps` by segmenting their color maps into 10 values.[2] We don't keep all the palettes in accordance with the following rules.

- **No repetition.** Some `Matplotlib` palettes are repeated.[3] In this case, we keep the first one regarding to the lexicographical order.
- **No reversed version.** Contrary to `Matplotlib`,[4] `@prism` never offers the reversed version of a palette as a fixed data.

In addition to the `Matplotlib` and `Scientific Coulour Maps` palettes, there are `@prism` creations.

Note.

If you are interested in adding palettes, go to the section 2.

III. Reuse from...

1. `Matplotlib`

Here are the important points to remember when using a palette similar to what `Matplotlib` offers.

1. `@prism` uses a standardized notation in camel case format. Therefore, `Matplotlib` palette names such as `berlin` and `gist_heat` become `Berlin` and `GistHeat` respectively.
2. All names ending with the suffix `_r` correspond to a reversal of the palette color order. These palettes are not integrated into the `@prism` project. However, the implementations provide ways to easily obtain these reversed palettes, as well as sub-palettes, and also palettes obtained by shifting the colors.

2. `Asymptote` and `Scientific Coulour Maps`

It is sufficient to apply the naming standardization explained in the previous section: see point 1.

IV. How to choose a palette?

The complete set of 128 palettes is visible in use cases in the following documents.

1. `showcase-en-std.pdf` is a document using a colored theme on a white background.
2. `showcase-en-dark.pdf` is a document using a colored theme on a black background.

V. Supported implementations

The implementations are inside the folder `products`.

1. JSON, the versatile default format

By default, a file `palettes.json` is provided to allow unsupported coding languages to also integrate `@prism` palettes. Here are the first line of this file.

```json
{
  "Accent": [
    [0.498039, 0.788235, 0.498039],
    [0.690196, 0.705881, 0.757298],
    [0.882352, 0.721568, 0.661437],
    [0.99477, 0.835294, 0.550326],
    [0.913289, 0.935947, 0.610021],
    [0.306317, 0.487581, 0.680174],
    [0.700653, 0.146404, 0.562091],
```

[2]`Asymptote` is also used, but to date, `Asymptote` offers nothing more than `Matplotlib`, despite different implementations.
[3]Surely for historical reasons.
[4]Most of the `Matplotlib` color maps have a reversed version named by adding the suffix `_r`. Perhaps this is for performance reasons...

```
    [0.855772, 0.162962, 0.316775],
    [0.671459, 0.366448, 0.159041],
    [0.4, 0.4, 0.4]
  ],
  ...
}
```

2. luadraw palettes

a. Description

You can use `@prism` palettes with `luadraw` which is a package that greatly facilitates the creation of high-quality 2D and 3D plots via `Lua` and Ti*k*Z.

Note.

Initially, the `@prism` project was created to provide ready-to-use palettes for `luadraw`.

b. Use a luadraw palette

The `Lua` palette names all use the prefix `pal` followed by the name available in the file `palettes.json`. You can access a palette by two ways.

- `palGistHeat` is a `Lua` variable.
- `getPal('GistHeat')` and `getPal('palGistHeat')` are equal to `palGistHeat`.

Note.

The `Lua` palette variables are arrays of arrays of three floats. Here is the definition of `palGistHeat`.

```
palGistHeat = {
    {0.0, 0.0, 0.0},
    {0.105882, 0.0, 0.0},
    {0.211764, 0.0, 0.0},
    {0.317647, 0.0, 0.0},
    {0.429411, 0.0, 0.0},
    {0.535294, 0.0, 0.0},
    {0.641176, 0.0, 0.0},
    {0.752941, 0.003921, 0.0},
    {0.858823, 0.145098, 0.0},
    {0.964705, 0.286274, 0.0},
    {1.0, 0.42745, 0.0},
    {1.0, 0.57647, 0.152941},
    {1.0, 0.717647, 0.435294},
    {1.0, 0.858823, 0.717647},
    {1.0, 1.0, 1.0}
}
```

There are also some options. To explain how this works, let's consider the following use case.

```
mypal = getPal(
    'GistHeat',
    {
        extract = {2, 5, 8, 9},
        shift   = 1,
        reverse = true
    }
)
```

To simplify the explanations, we will refer to the colors in the standard palette `'GistHeat'` as `coul_1`, `coul_2`,, etc. The options are then processed in the following order.

1. `{coul_2, coul_5, coul_8, coul_9}` is the result of the extraction.

2. `{coul_9, coul_2, coul_5, coul_8}` comes from the shifting applied to the extracted palette (colors move to the right if `shift` is positive).
3. `{coul_8, coul_5, coul_2, coul_9}` is the reversed version of the shifted palette.

VI. Contribute via `Git`

Caution.

Never use the `main` *branch, which is for freezing the latest stable versions of projects in the mono repository* *`https://github.com/projetmbc/for-writing`.*

1. Complete the translations

Important.

Although we're going to explain how to translate the documentation, it doesn't seem relevant to do so, as English should suffice these days.

```
translate
├─ changes
├─ en
│  └─ manual
├─ status
│  └─ en
│     └─ manual.yaml
├─ README.md
└─ LICENCE.txt
```

Figure 1: Simplified view of the translation folder

The translations are roughly organized as in figure 1 where just the important folders for the translations have been "*opened*".[5] **A little further down, the section e explains how to add new translations**.

a. The `en` folder

This folder, managed by the author of `@prism`, contains files easy to translate even if you're not a coder.

b. The `changes` folder

This folder is a communication tool where important changes are indicated without dwelling on minor modifications specific to one or more translations.

c. The `status` folder

This folder is used to keep track of translations from the project's point of view. Everything is done via well-commented `YAML` files, readable by a non-coder.

d. The `README.md` and `LICENCE.txt` files

The `LICENCE.txt` file is aptly named, while the `README.md` file takes up in English the important points of what is said in this section about new translations.

[5]This was the organization on October 26, 2025.

e. New translations

Note.

The folder `manual` *is reserved for documentation. It contains* TEX *files that can be compiled directly for real-time validation of translations.*

Warning.

Only start from the `en` *folder, as it's the responsibility of the* `@prism` *author.*

Let's say you want to add support for Italian from files written in English.[6] To do this, you must use `Git` as follows.

1. Via `https://github.com/projetmbc/for-writing/tree/aprism/@prism`, recover the entire project folder. Do not use the `main` branch, which is used to freeze the latest stable versions of projects in the single `https://github.com/projetmbc/for-writing` repository,.
2. In the `@prism/contrib/translate` folder, create an `it` copy of the `en` folder, with the short name of the language documented in the page "*IIETF language tag*" from `Wikipedia`.
3. Once the translation is complete in the `it` folder, share it via `https://github.com/projetmbc/for-writing/tree/aprism/@prism` using a classic `git push`.

2. Improving the source code

Participation as a coder is made via the repository `https://github.com/projetmbc/for-writing/tree/aprism/@prism` corresponding to the `@prism` development branch. Here is what you can do, details can be found in the file `https://github.com/projetmbc/for-writing/blob/aprism/@prism/contrib/products/README.md`.

1. Create new palettes in one of the existent implementations.
2. Propose a new implementation.

VII. History

1.2.0
2025-10-29

Break.

- Palettes: all final palettes now consist of 10 colors.
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  - `reverse`: a boolean value indicating whether to reverse the palette color order (`false` by default).
  - `shift`: an integer value for applying a circular color shift to the palette.
- Documentations
  - Added English PDF manual.
  - Showcase: two PDF files demonstrate the use of each palette (white and dark modes).

1.1.0
2025-10-14

Break.

- Duplicate palettes and those that are reverse of others are ignored (strict equalities only).

[6] As mentioned above, there is no real need for the `doc` folder.

New.

- New palettes added: `BurningGrass`, `GeoRainbow` and `PastelRainbow` (`luadraw` package creation process used).
- The `luadraw` palette product has a new dictionary like variable `getPal` to access a palette using its name (as a string variable).

Update.

- Palette contributions: in the mandatory `extend.py` file, `build_code` must work with the dictionary of all the palettes, and manage a credit to the `@prism` project.

1.0.0
2025-10-11

First public version of the project.