Matplotlib custom tools universe

https://github.com/fariza/pycon2017

Optical specialist @ Matrox

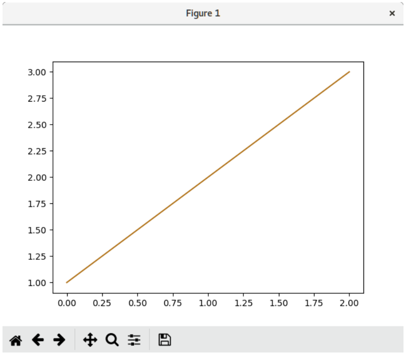
November 19, 2017

Who is this for?

- Do you play with a lot of data?
- Do you plot?
- Do you plot a lot of data?
- Do you want to get your hands dirty?
- You didn't have anything better to do?

The gui

- Key-only tools
  - Grid
  - log
  - ...
- Toolbar buttons
  - Home
  - save
  - ...



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- Single function (Huge, ugly)

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- No way to know the associated keys

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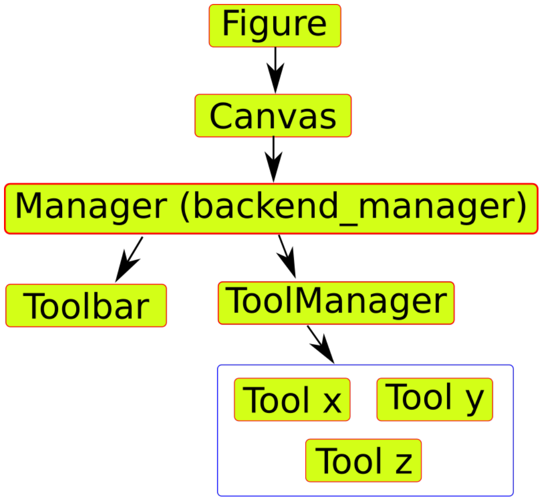
- Backend specific code
- Gui and process is done in the same place
- No "easy" way to call methods inside the toolbar
- No way to add new tools without writing a new backend

New age

Where to find things



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ToolManager

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- Keep track of associated keys
- Manage tool radio groups

New age

Tools

- Two kind of tools:

New age

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- Two kind of tools:
    - Basic tool

New age

Tools

- Two kind of tools:
  - Basic tool
  - Toggle tool

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- Two important methods: addtool, removetool
- Hooks to tool-events to change button state if a tool is triggered by any way other than "click"
- Simple backend creation

Does it work?

Let's check

```
import matplotlib
# matplotlib.use('GTK3Agg')
matplotlib.use('tkAgg')
matplotlib.rcParams['toolbar'] = 'toolmanager'
import matplotlib.pyplot as plt

fig = plt.figure()
plt.plot([1, 2, 3], label='Super data')
plt.show()
```

Play with buttons

Remove one button

```
fig.canvas.manager.toolbar.remove_toolitem('forward')
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```

Completely remove one button

```
fig.canvas.manager.toolmanager.remove_tool('save')
```

Simple tool

Extra-Simple tool

```
from matplotlib.backend_tools import ToolBase


class ExtraSimple(ToolBase):
    description = 'Encourage yourself'
    default_keymap = 'C'

    def trigger(self, *args, **kwargs):
        self.toolmanager.message_event("You are doing great!!")
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Add the tool to toolmanager

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fig.canvas.manager.toolmanager.add_tool('simple', ExtraSimple)
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fig.canvas.manager.toolmanager.add_tool('simple', ExtraSimple)
```

Add to the toolbar

```
fig.canvas.manager.toolbar.add_tool('simple', 'navigation')
```

Toggle tool

Toggle legend

```python
from matplotlib.backend_tools import ToolToggleBase

class ToggleLegend(ToolToggleBase):
    description = 'Toggle the legend'
    default_toggled = True
    default_keymap = 'l'

    def visibility(self, state):
        for leg in list(self.figure.legends):
            leg.set_visible(state)
        for a in self.figure.get_axes():
            leg = a.get_legend()
            if leg:
                leg.set_visible(state)
        self.figure.canvas.draw_idle()

    def enable(self, event):
        self.visibility(True)

    def disable(self, event):
        self.visibility(False)
```

Toggle tool

Add a legend

```
plt.legend()
```

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Add the tool

```
fig.canvas.manager.toolmanager.add_tool('legend', ToggleLegend)
fig.canvas.manager.toolbar.add_tool('legend', 'io')
```