Animation-Examples

April 3, 2025

1 Animation Examples

Arthur Ryman, last updated 2025-04-03

1.1 Introduction

These examples are taken from the `matplotlib` animation documentation.

Start by importing the required packages.

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
from matplotlib.animation import FuncAnimation
import matplotlib.animation as animation
from IPython.display import HTML
```

Create some global variables that the animation functions can access. * create a Figure `fig` with a single Axes `ax` * create empty data arrays `xdata` and `ydata` for a Line2D plot * create a Line2D Artist `ln`

Close the figure to suppress drawing the static plot in Jupyter.

[2]:
```
fig, ax = plt.subplots()
xdata, ydata = [], []
ln, = ax.plot([], [], 'ro')

# Suppress static plot
plt.close(fig)
```

Define the animation functions `init` and `update`. They act on the previously defined global variables. The both return an Artist.

The `update` function takes a frame as its first argument. The `ln` artist is updated with the new data.

Just for fun, only use the last N data points. I believe that `FuncAnimation` precomputes all the frames and packages them into the animation object `ani`. It can then write `ani` to a file or display it in a widget.

[3]:
```
N = 20
```

```
def init():
    ax.set_xlim(0, 2*np.pi)
    ax.set_ylim(-1, 1)
    return ln,

def update(frame):
    xdata.append(frame)
    ydata.append(np.sin(frame))

    ln.set_data(xdata[-N:], ydata[-N:])
    return ln,

# Create animation
ani = FuncAnimation(fig, update, frames=np.linspace(0, 2*np.pi, 128),
                    init_func=init, blit=True, interval=50)

# Display animation in Jupyter Notebook
HTML(ani.to_jshtml())
```

[3]: <IPython.core.display.HTML object>