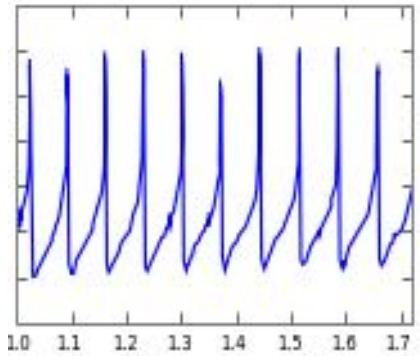
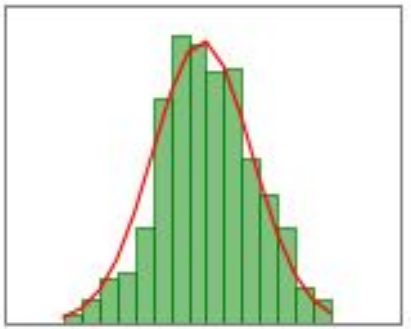
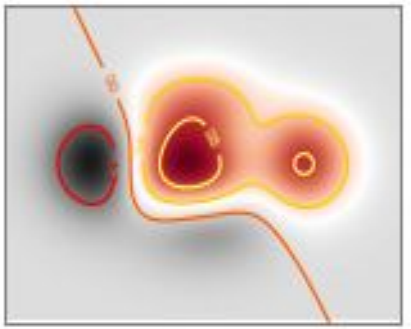
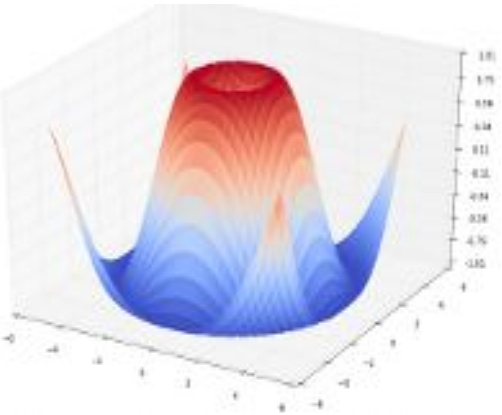
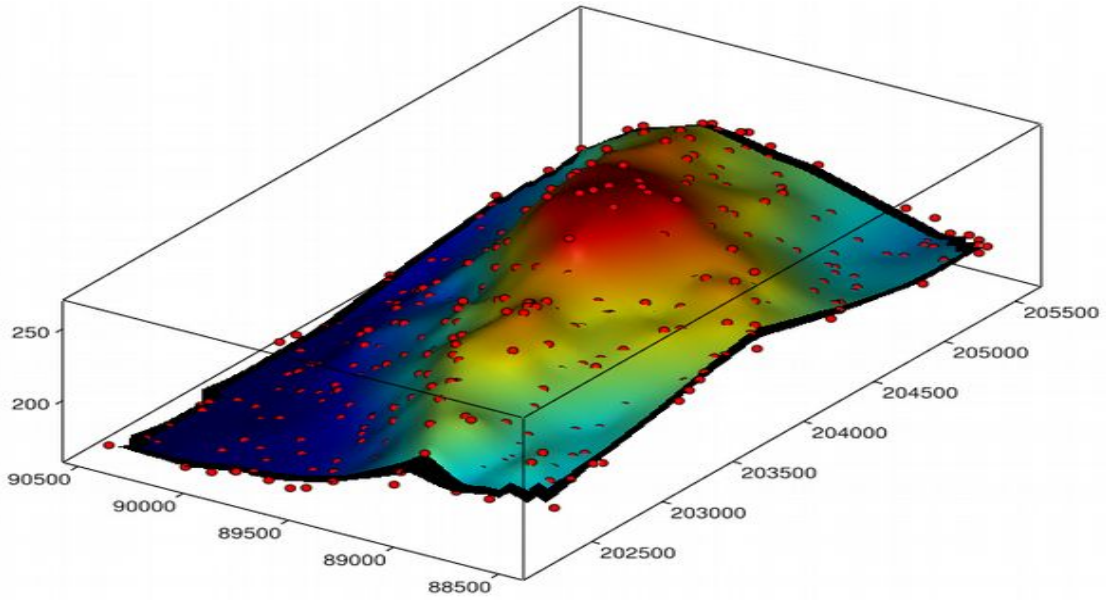
Visualisation in Python

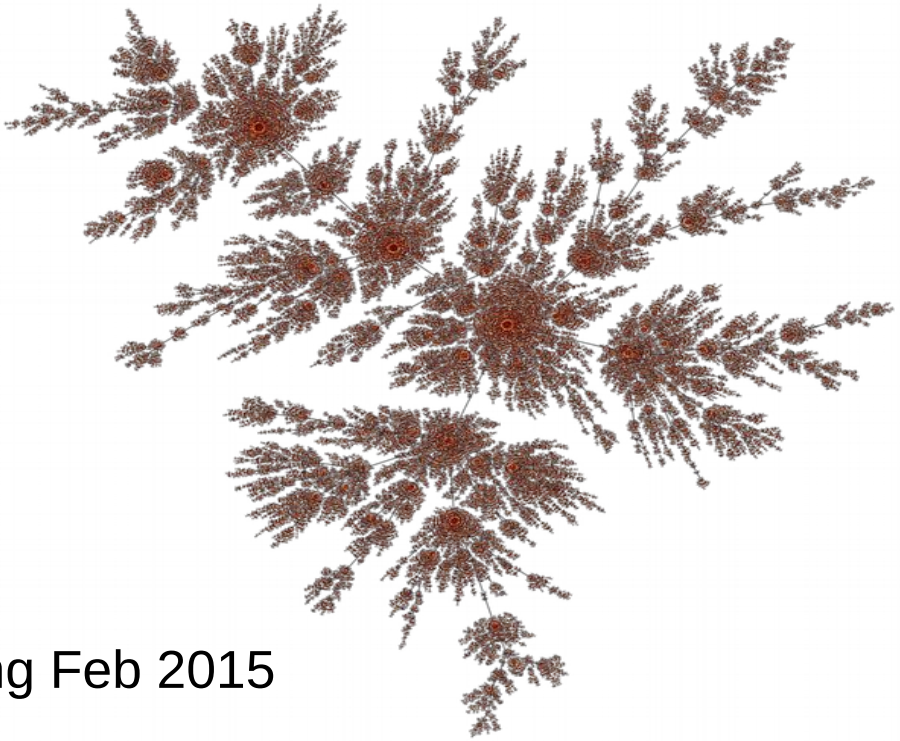










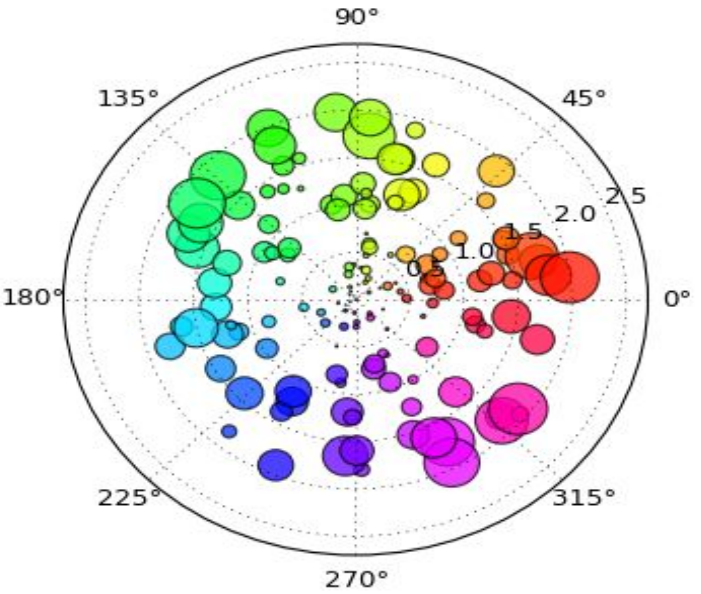


TC. Pynxton meeting Feb 2015

Matplotlib, the legacy

http://matplotlib.org/

- 1D, 2D, 3D; lots of functionalities
- Could be functional or OOP
- Lots of high quality outputs
- Simple but that's also a strenght
- Widely used (bug free)




```
from matplotlib import scatter
c = scatter(theta, r, c=colors, s=area)
```

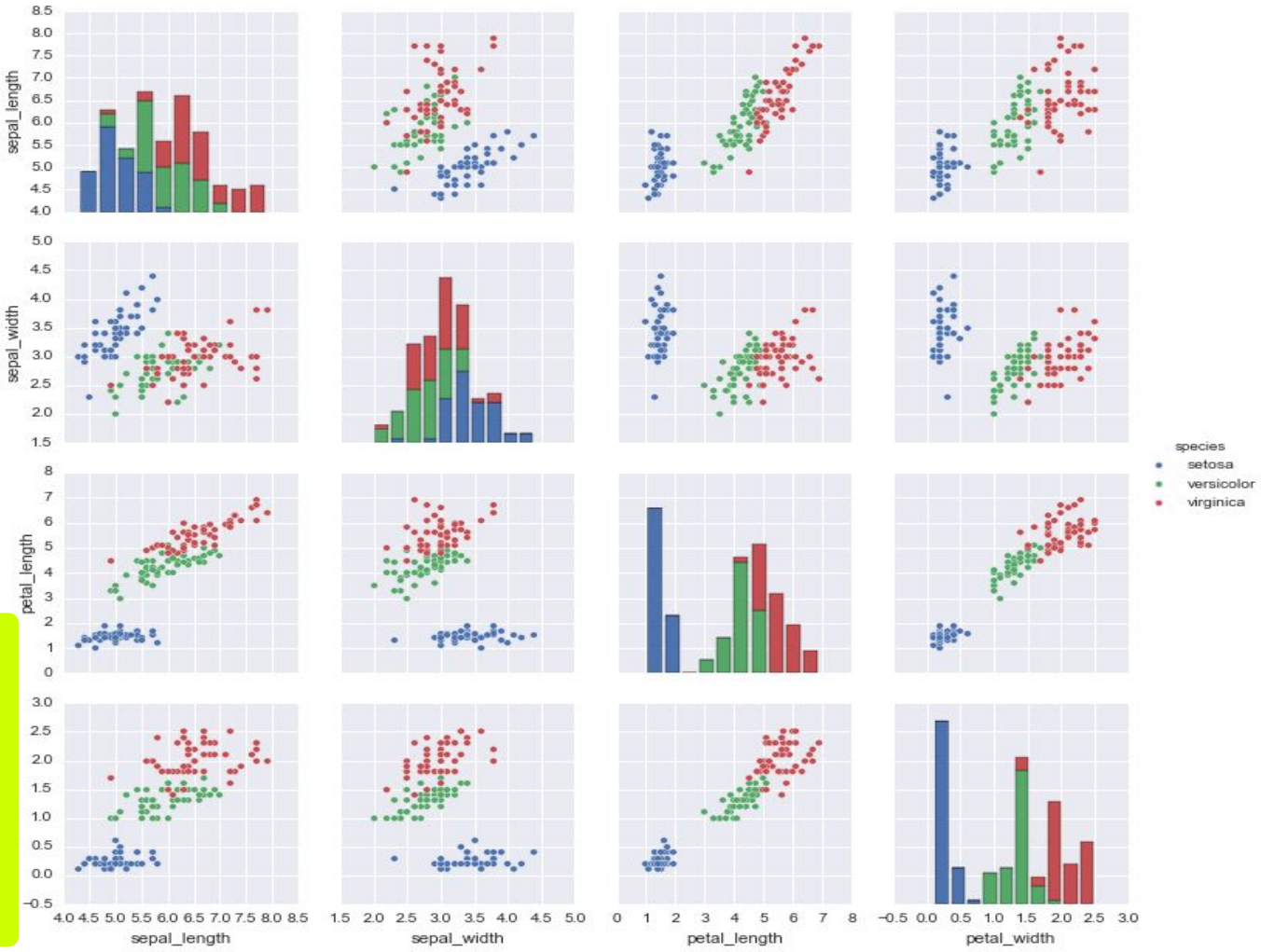
Seaborn

http://stanford.edu/~mwaskom/software/seaborn/

- See Marco's talk

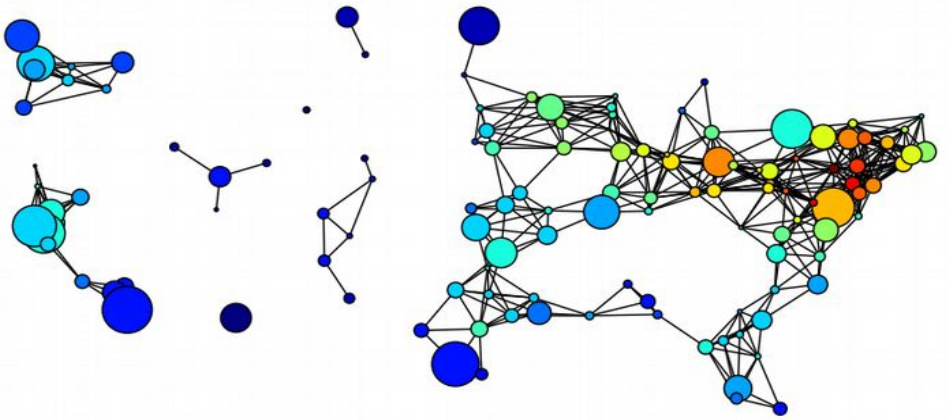
```
import seaborn as sns
sns.set()

df = sns.load_dataset("iris")
sns.pairplot(df, hue="species",
size=2.5)
```



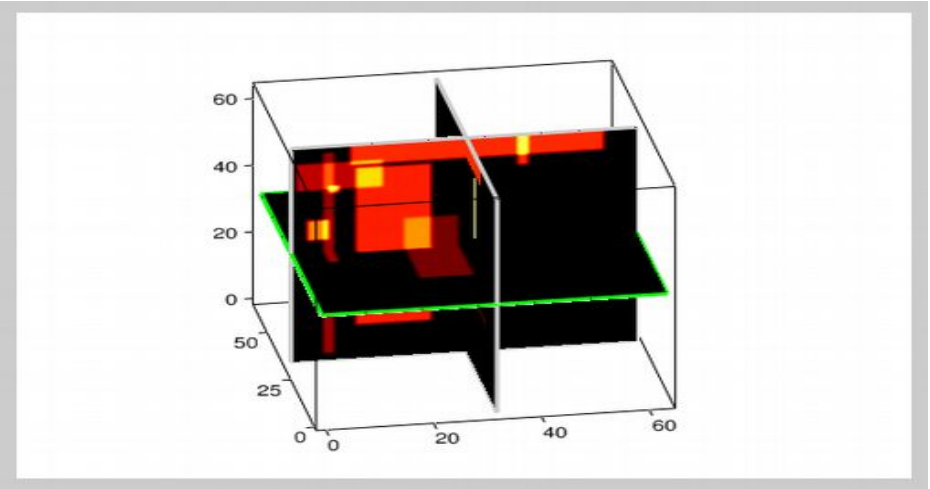
Graph

- Networkx: based on either matplotlib or Graphviz
-
- Igraph: matplotlib
- Graph-tool: OpenGL
  - http://graph-tool.skewed.de/static/doc/demos/animation.html
-



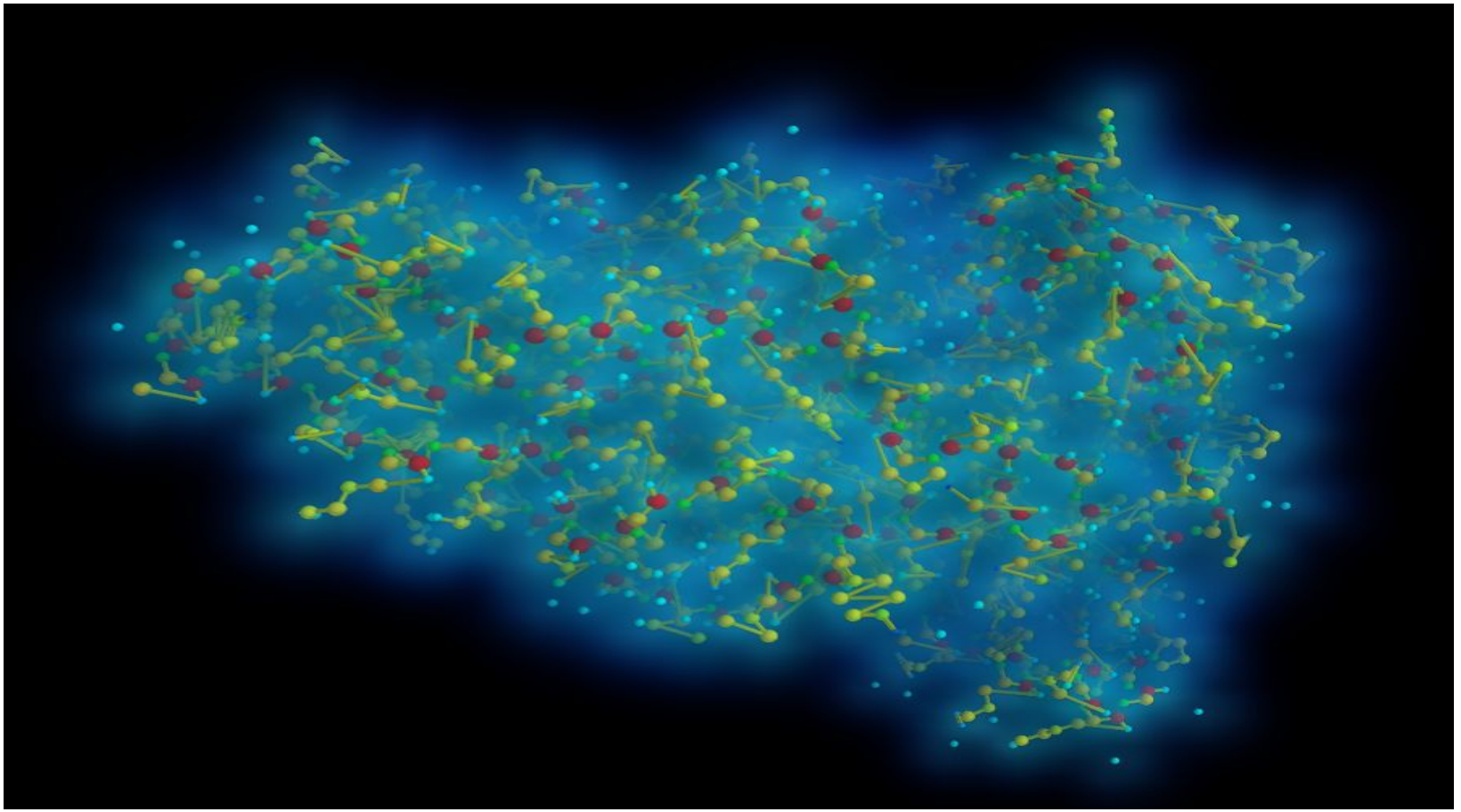
More libraries

- Vizpy: openGL based. Code is not simple but gallery shows nice examples.
- Galry: another OpenGL library https://github.com/rossant/galry
- Visvis : see example http://code.google.com/p/visvis/wiki/example_slicesInVolume



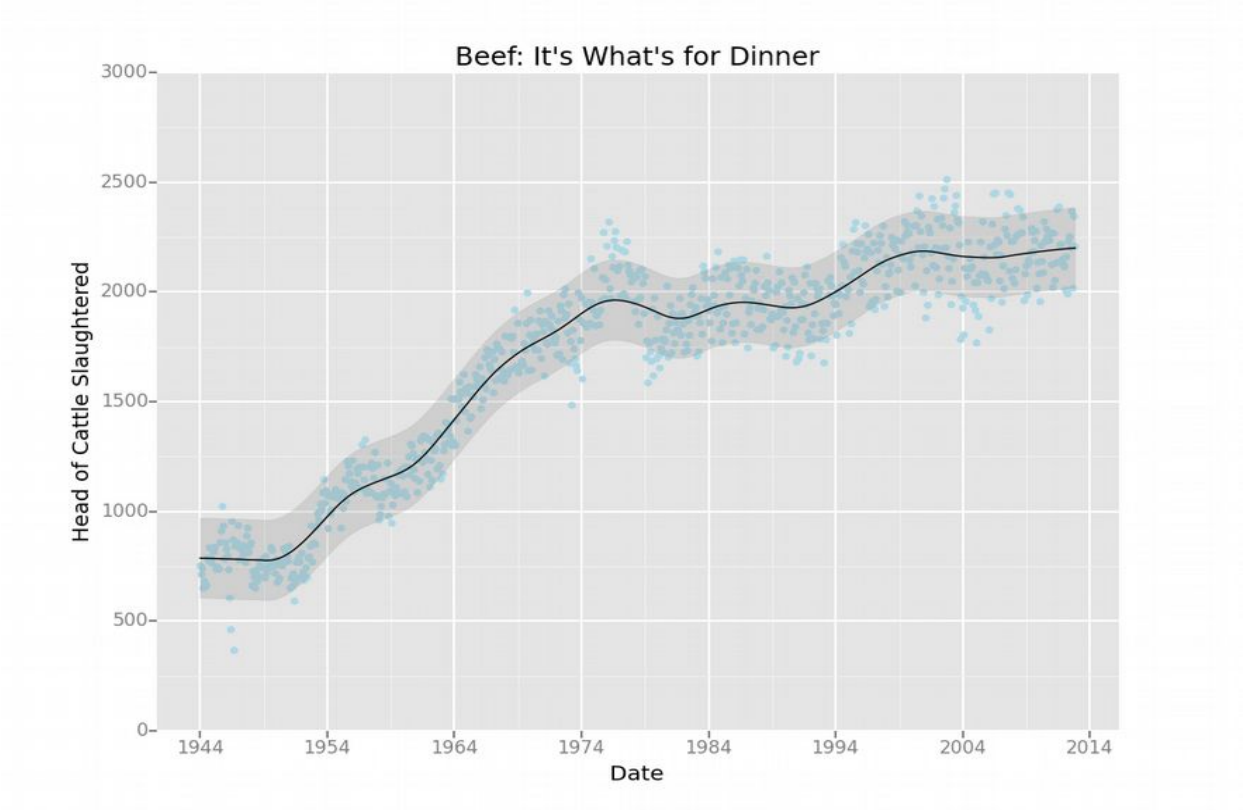
More libraries

- Mayavi: 3D. example pdb



ggplot

https://github.com/yhat/ggplot




```
from ggplot import *

ggplot(aes(x='date', y='beef'), data=meat) +  geom_point(color='lightblue') + stat_smooth(span=.15, color='black', se=True) +  ggtitle("Beef: It's What's for Dinner") +   xlab("Date") +  ylab("Head of Cattle Slaughtered")
```

Interactivity

- Matplotlib: contains actually lots of facilities for interactions but you need to write the code...

  Example test_pylab.py
- Javascript/Python combined: e.g., mpld3
- Plotly: Makes your matplotlib/ggplot/prettyplot plots interactive within your notebook. See http://nbviewer.ipython.org/gist/msund/11349097 Nice job but you'll need an account on plotly
- Lots of librairies are appearing all the time those days...
- Dedicated to Bio: BioJS

GUI

- PyQt
- Kivy: http://kivy.org/#home

Conclusions

- Learn matplotlib. It's easy and used by lots of other libraries. This will be enough for 90% of your plotting requirements
- Pick up one of the library with interaction/javascript if you need interaction.
- For speed and 3D, vispy/visvis looks nice. Just be aware that OpenGL may not be available on all machines (e.g. cluster).
- Those slides did not cover all libraries. You may find even better libraries online for specific needs