Last Time

1. OpenCV-Python
Today

1. Graphics
2. Other packages and use cases
How (not) to make graphics

"the worst graphic ever to find its way into print"

Revision
AGE STRUCTURE OF COLLEGE ENROLLMENT

Percent of Total Enrollment 25 and Over

- 1972: 26.0%
- 1973: 29.2%
- 1974: 32.8%
- 1975: 33.8%
- 1976: 33.0%
How (not) to make graphics

Poor presentation
Good presentation
Chart 2 - Total Expenditures on Health as a Percentage Share of GDP, by OECD Country, 2004

Note: For the United States the 2004 data reported here do not match the 2004 data point for the United States in Chart 1 since the OECD uses a slightly different definition of "total expenditures on health" than that used in the National Health Expenditure Accounts.
Expenditures on Health as Percentage of GDP for OECD Countries, 2004

United States
Switzerland
France
Germany
Austria
Belgium
Ireland
Portugal
Canada
Norway
Greece
Australia
Netherlands
Denmark
Sweden
Italy
New Zealand
United Kingdom
Spain
Hungary
Japan
Luxembourg
Turkey
Ireland
Finland
Czech Republic
Slovak Republic
Mexico
Poland
Korea

Share of GDP (%)
How to make graphics

Remove to improve

Weather NYT 538

Excellence in Plotting 1 2 3

xkcd 1 2 3 4 5
How to make graphics with Python

iPython Notebook

HTML
Other packages

PyPI - the Python Package Index
https://pypi.python.org/pypi

pip install package
SymPy is a Python library for symbolic mathematics. It aims to become a full-featured computer algebra system (CAS) while keeping the code as simple as possible in order to be comprehensible and easily extensible. SymPy is written entirely in Python and does not require any external libraries, except optionally for plotting support.

Link  Example
pyFOAM

- analyze the logs produced by OpenFoam-solvers
- execute OpenFoam-solvers and utilities and analyze their output simultaneously
- manipulate the parameter files and the initial-conditions of a run in a non-destructive manner
- plots the residuals of OpenFOAM solvers
- lots of other stuff

[Link]
control

- Linear input/output systems in state-space and frequency domain
- Block diagram algebra
- Time response: initial, step, impulse
- Frequency response: Bode and Nyquist plots
- Control analysis: stability, reachability, observability, stability margins
scikit-learn

scikit-learn is a Python module for machine learning built on top of SciPy and distributed under the 3-Clause BSD license.
Pygame is a set of Python modules designed for writing games. Pygame adds functionality on top of the excellent SDL library. This allows you to create fully featured games and multimedia programs in the python language.
requests

Requests allow you to send HTTP/1.1 requests. You can add headers, form data, multipart files, and parameters with simple Python dictionaries, and access the response data in the same way. It’s powered by httpplib and urllib3, but it does all the hard work and crazy hacks for you.
Homework

Write code every day.