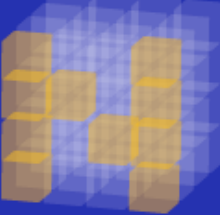


NumPy and SciPy

A “His” Story

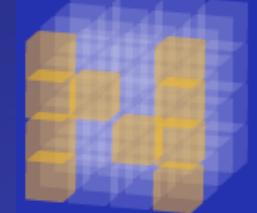
Travis E. Oliphant



Tell me a story...

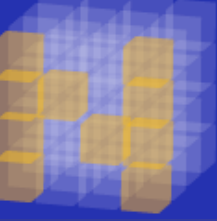


EuroSciPy
2008



My story of SciPy...

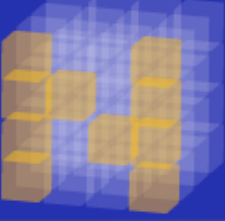




In the beginning....

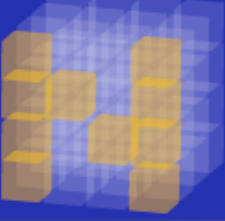


was Guido....

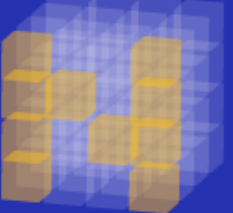


EuroSciPy
2008

was Guido....

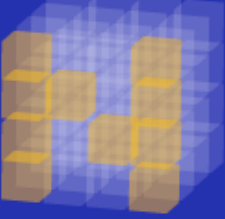


Jim Fulton

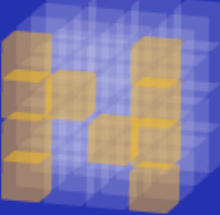


- Created first Matrix object
- Released it to the net in 1994
- Started getting feedback on Matrix-SIG
- Convinced Guido to change some syntax
 - `a[0,1]` instead of `a[(0,1)]`
 - `a[:,2]` instead of only `a[:]`
 - Ellipsis operator

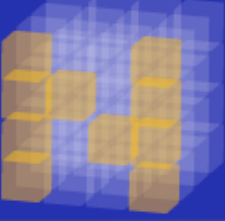
Jim Hugunin



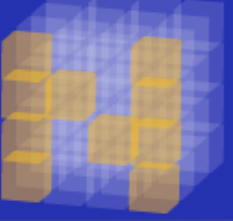
Supporting cast...



Paul Dubois



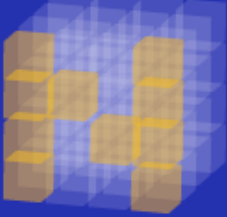
David Ascher



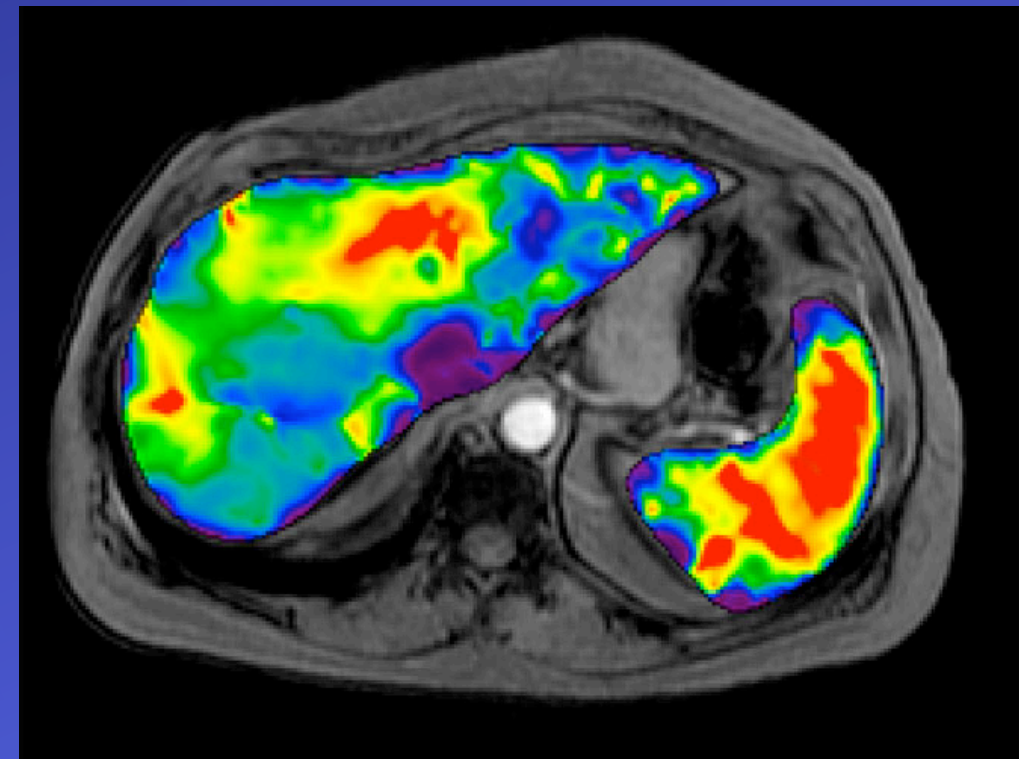
Jim Fulton



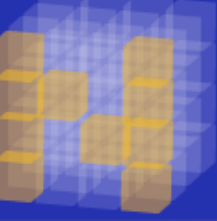
1997



Medical Imaging at Mayo Clinic



EuroSciPy
2008



Michael A. Miller

Guido's essay on
reference counting

TableIO

1998
numpyio

Reference to
Numeric C-API



NumPy

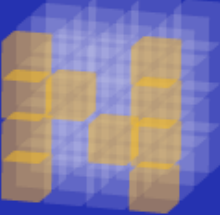
SciPy

1998-2000

multipack

ODE's (odepack)
Integrals (quadpack)
Optimization (minpack)

sparse matrices
cephes (special functions)
fftw wrappers
signal processing

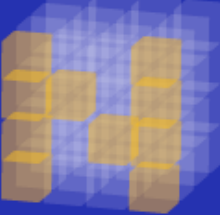


1998-2000

multipack

ODE's (odepack)
Integrals (quadpack)
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sparse matrices
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signal processing

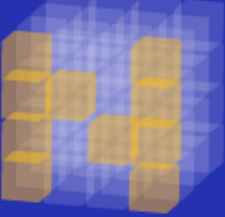


1998-2000

multipack

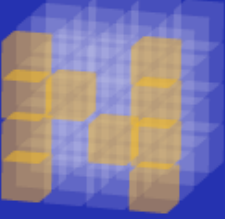
ODE's (odepack)
Integrals (quadpack)
Optimization (minpack)

sparse matrices
cephes (special functions)
fftw wrappers
signal processing

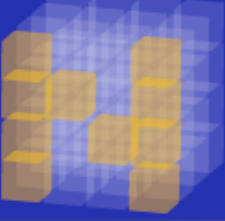


EuroSciPy
2008

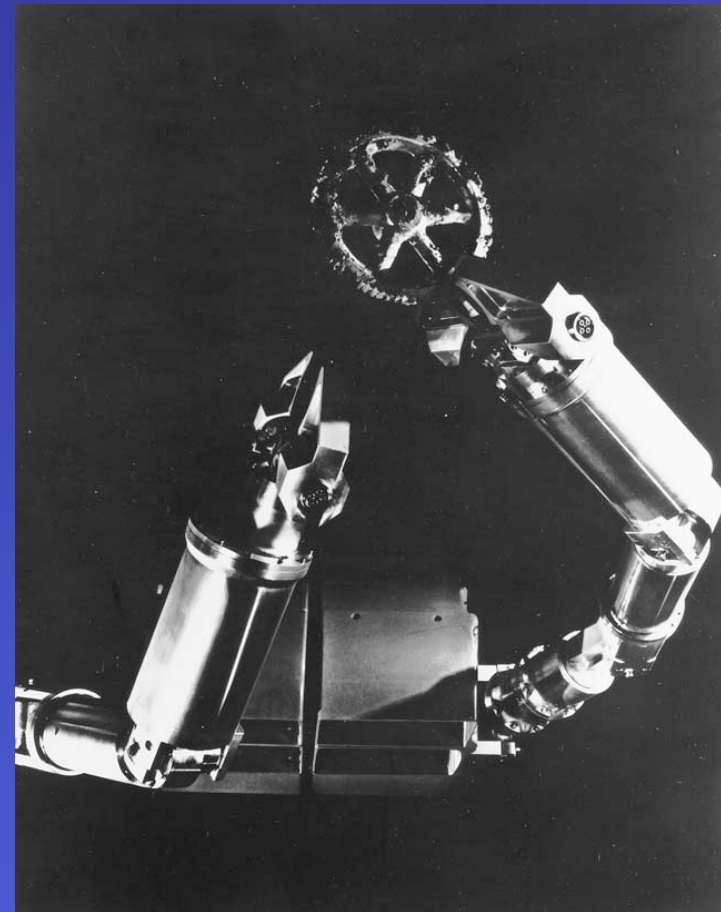
Pearu Peterson



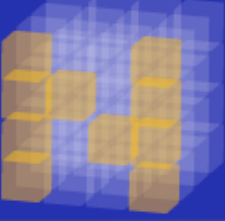
Pearu Peterson



automator

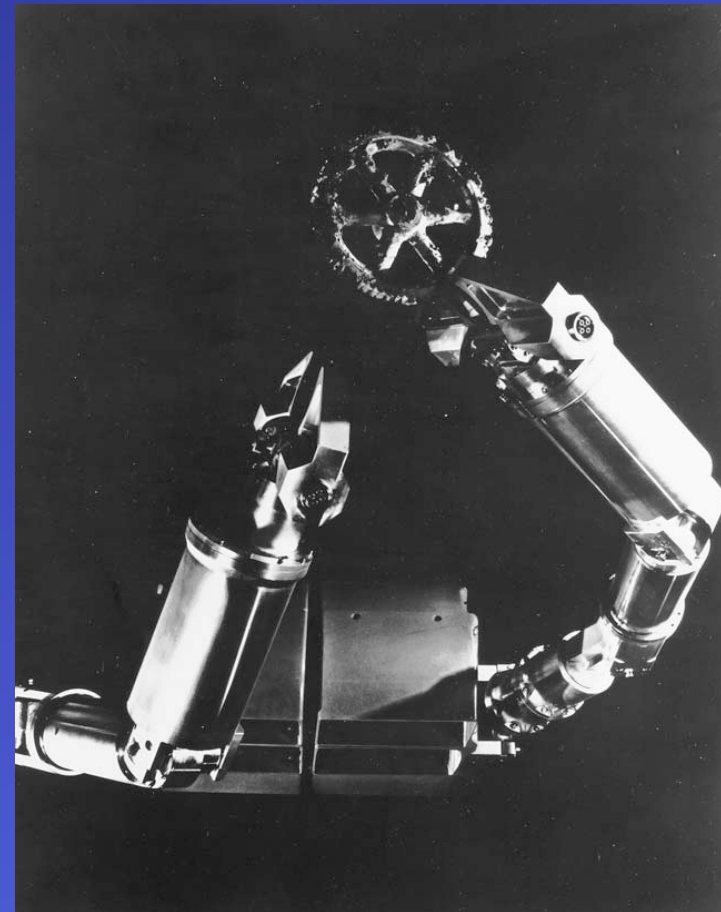


Pearu Peterson



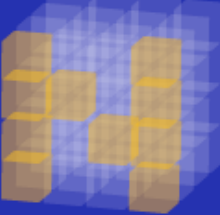
F2Py

automator



EuroSciPy
2008

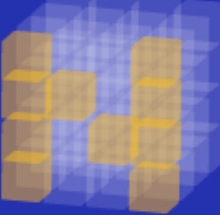
Eric Jones



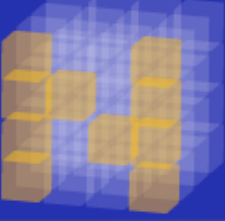
EuroSciPy
2008

Eric Jones

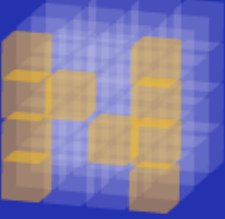
Weave
Genetic Algorithms
Cluster



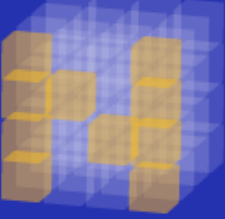
EuroSciPy
2008

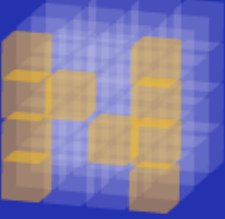


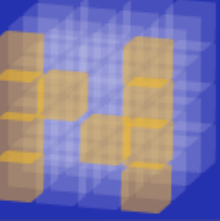
EuroSciPy
2008



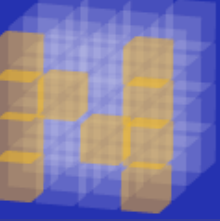
EuroSciPy
2008







SciPy 2001

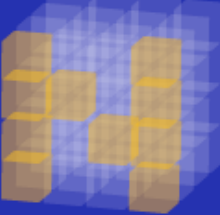


Gary
Strangman

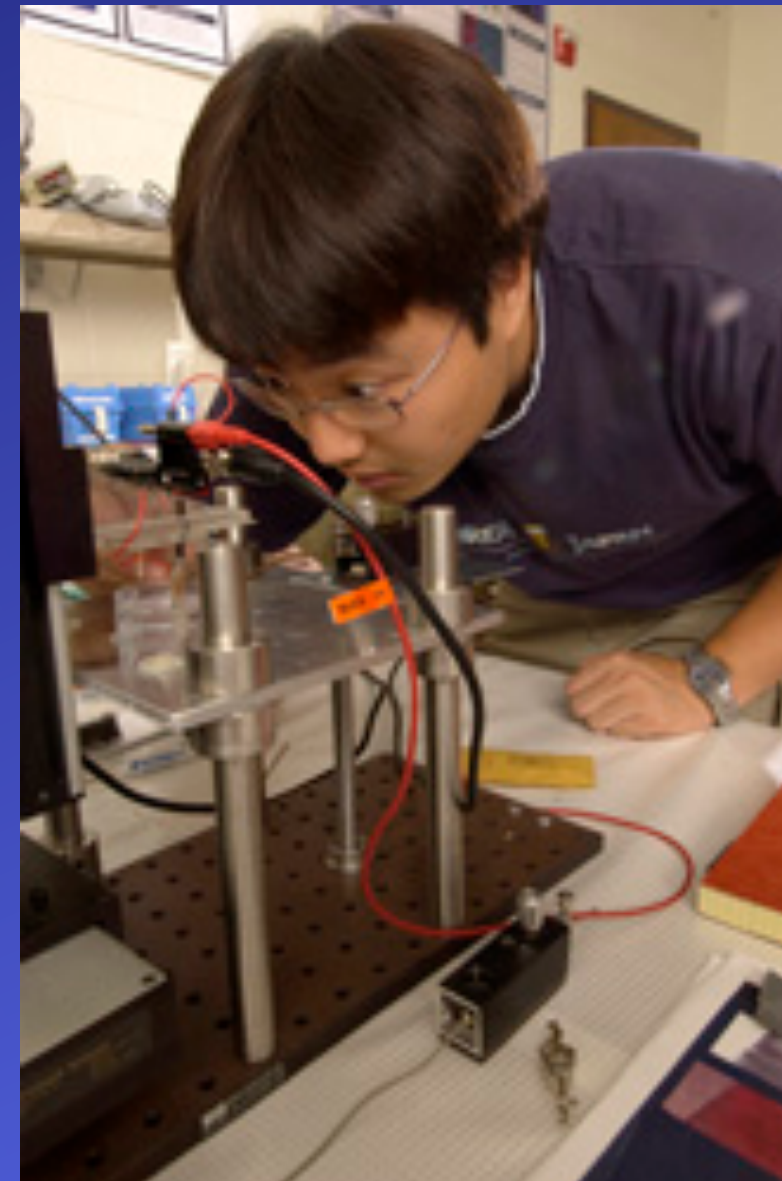


SciPy 2001

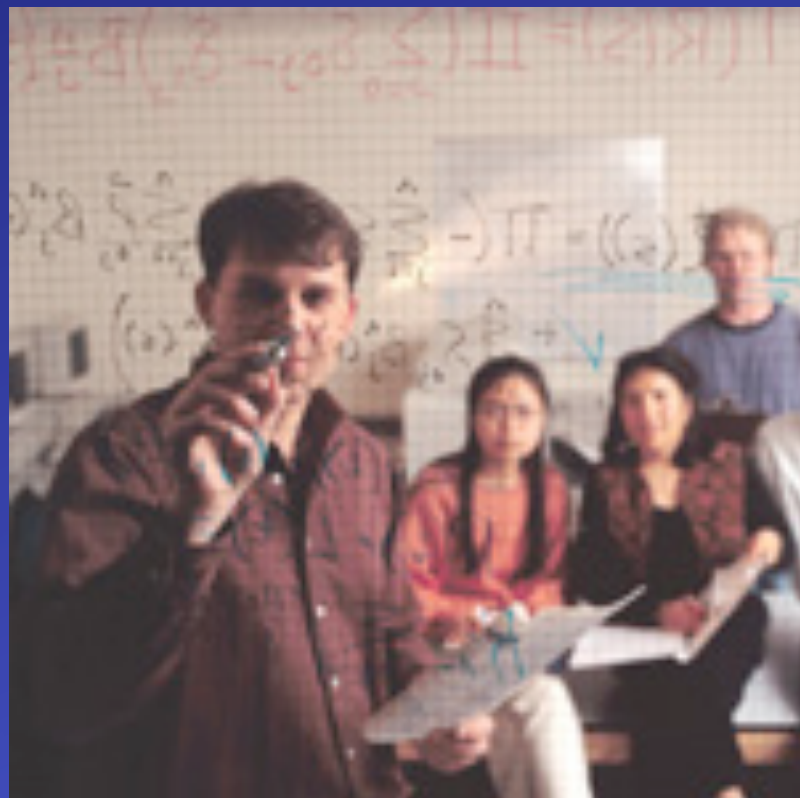
BYU



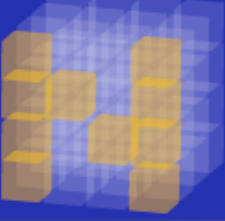
Research



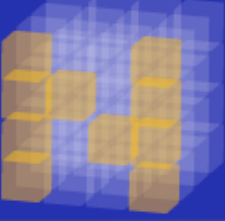
Teaching



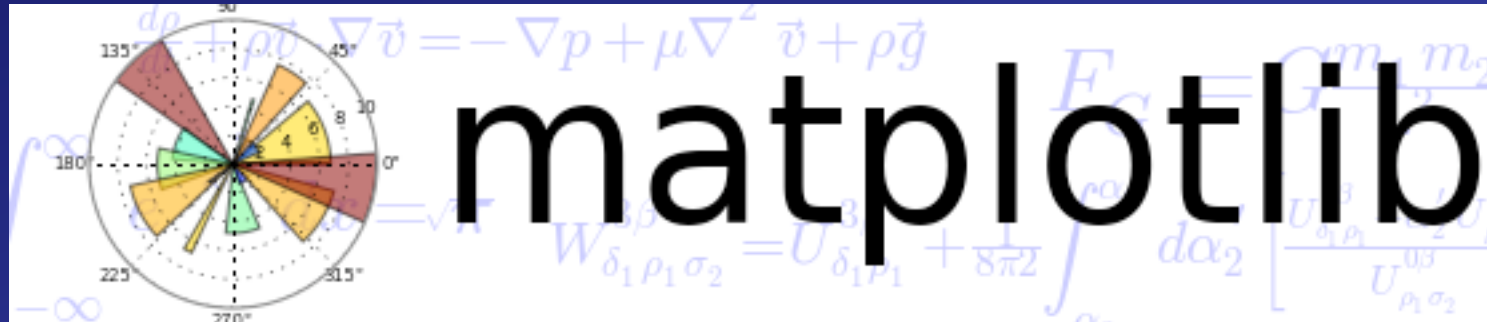
BYU : enlist students



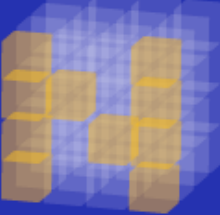
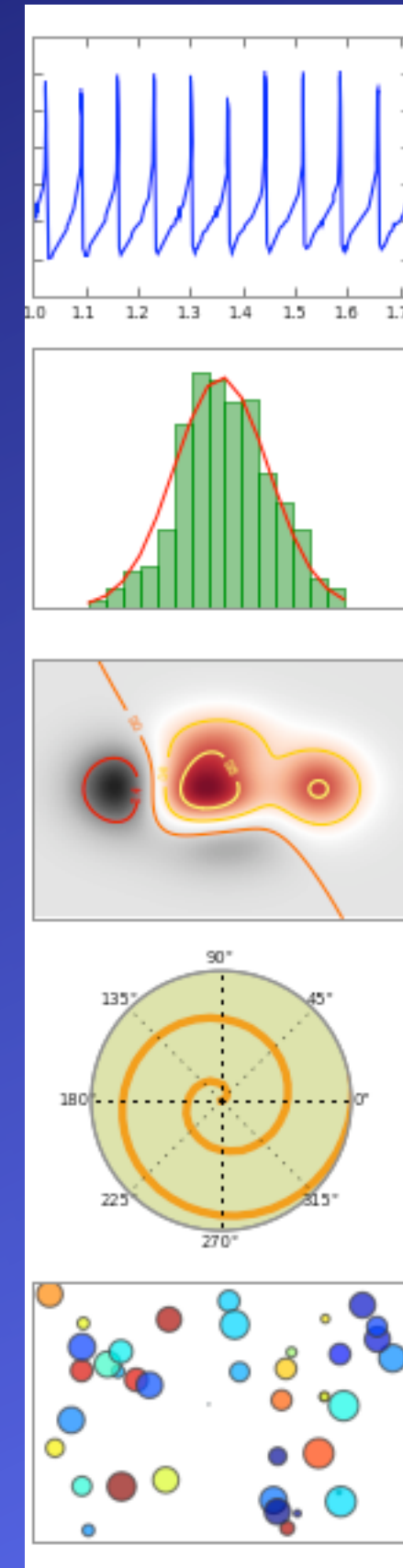
BYU : enlist students



Important Help



John Hunter
2001



IPython

Janko Hauser

Fernando Perez
Dec 10, 2001

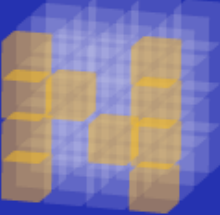


```
PyLab
Enthought Python Distribution (2.5.2001) -- http://code.enthought.com
Python 2.5.2 IEPD 2.5.2001 (release25-maint:60919M, Feb 21 2008, 10:31:43) [MSC
v.1310 32 bit (Intel)]
Type "copyright", "credits" or "license" for more information.

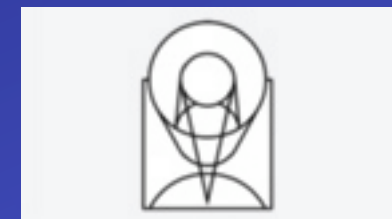
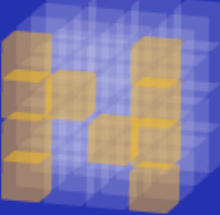
IPython 0.8.1 -- An enhanced Interactive Python.
?      -> Introduction to IPython's features;
%magic -> Information about IPython's 'magic' % functions.
help    -> Python's own help system.
object? -> Details about 'object'. ?object also works, ?? prints more.

Welcome to pylab, a matplotlib-based Python environment.
For more information, type 'help(pylab)'.

In [1]: a = array([1,2,3,4])
In [2]: a + 10
Out[2]: array([11, 12, 13, 14])
In [3]: _
```



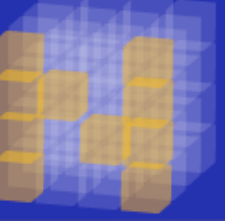
Numarray 2003



Perry Greenfield
J. Todd Miller
Rick White
Paul Barrett

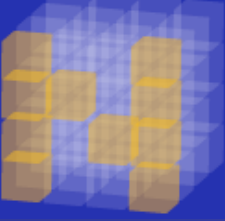


EuroSciPy
2008



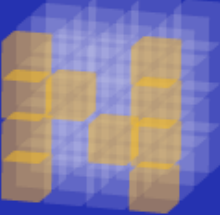
Numarray Issues

- was too slow for small arrays
- incomplete implementation of ufunc C-API
- minimal Numeric code re-use



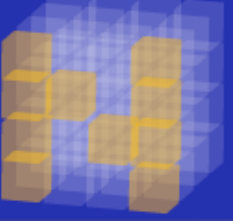
ndimage





ndimage



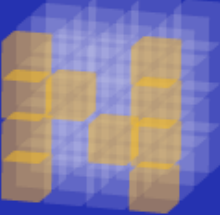


Split in the Community

SciPy/Numeric

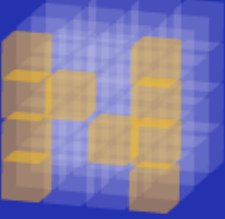


Numarray/ndimage

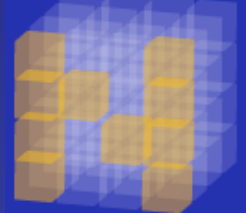


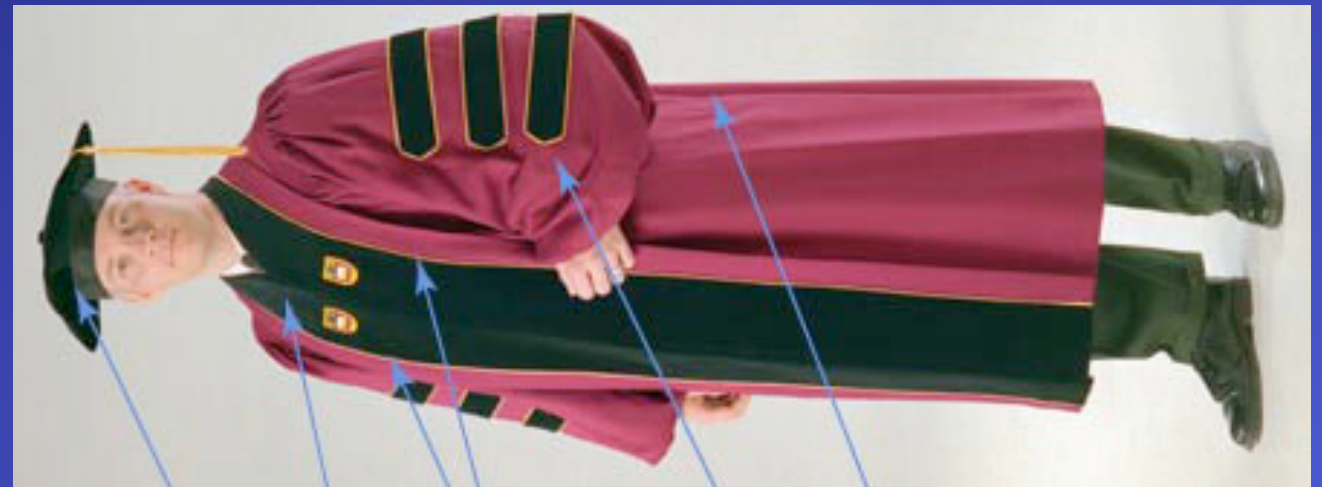
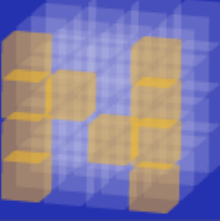
NumPy

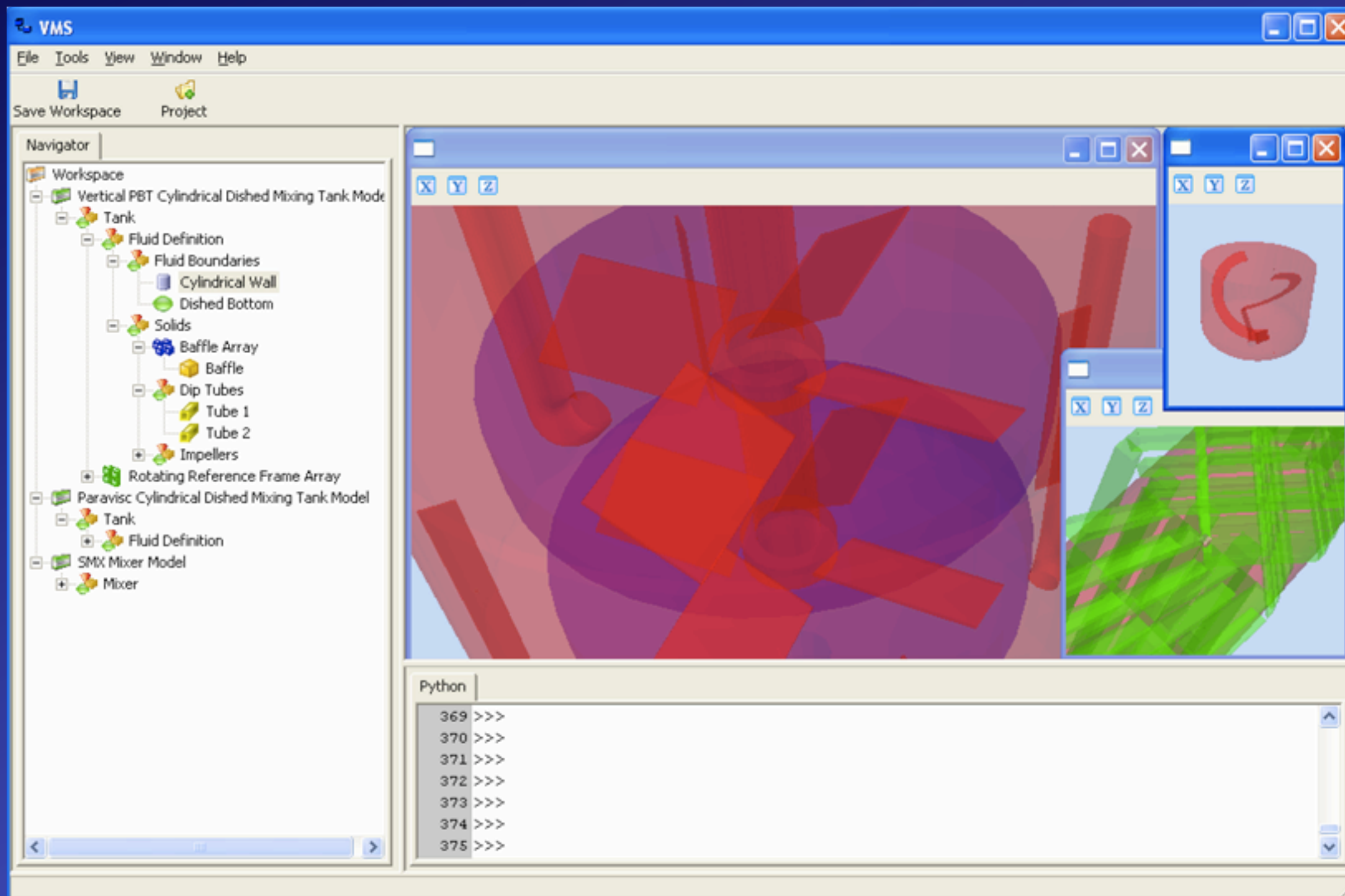
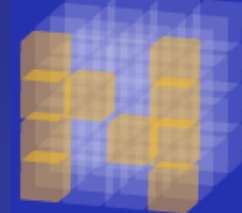




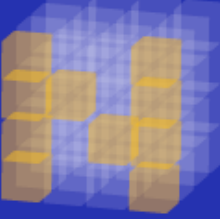
EuroSciPy
2008



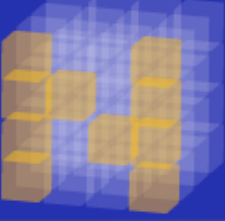




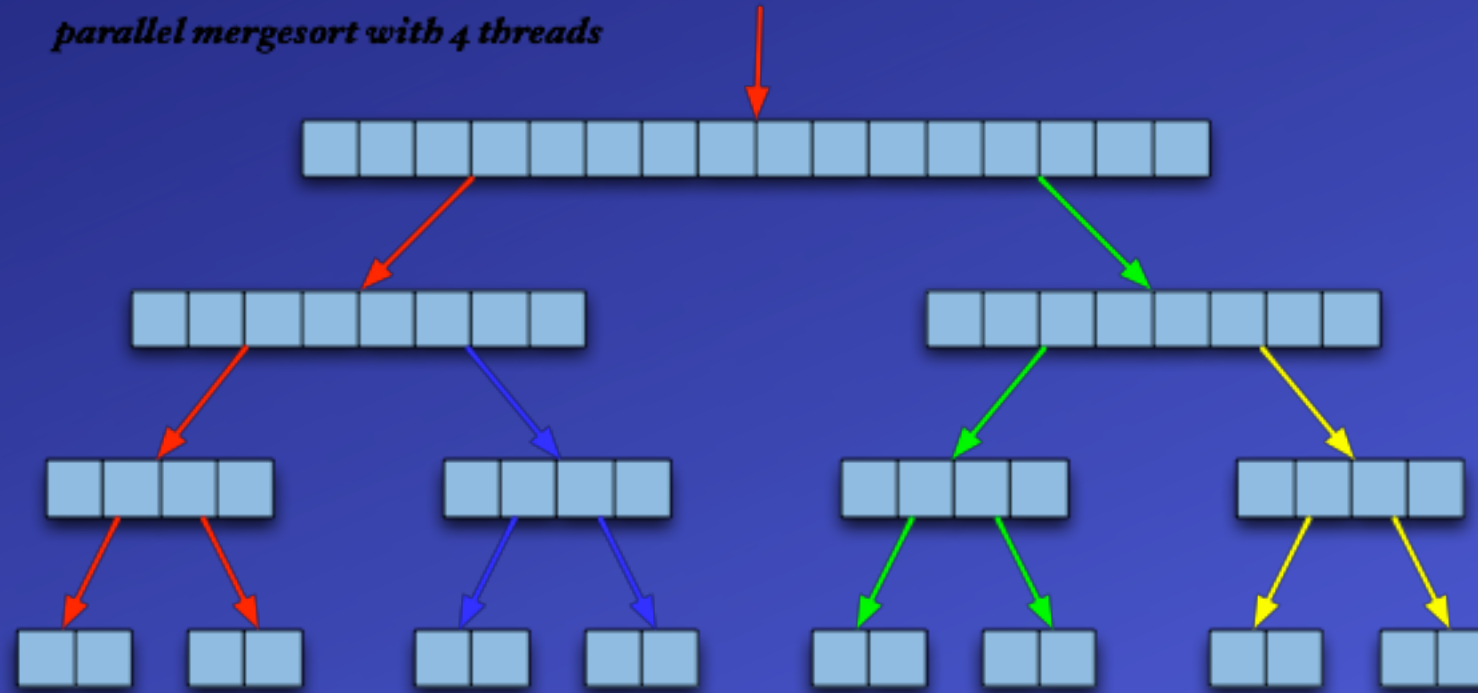
Robert Kern

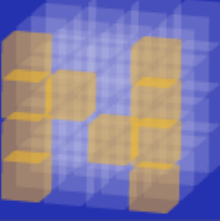


Chuck Harris



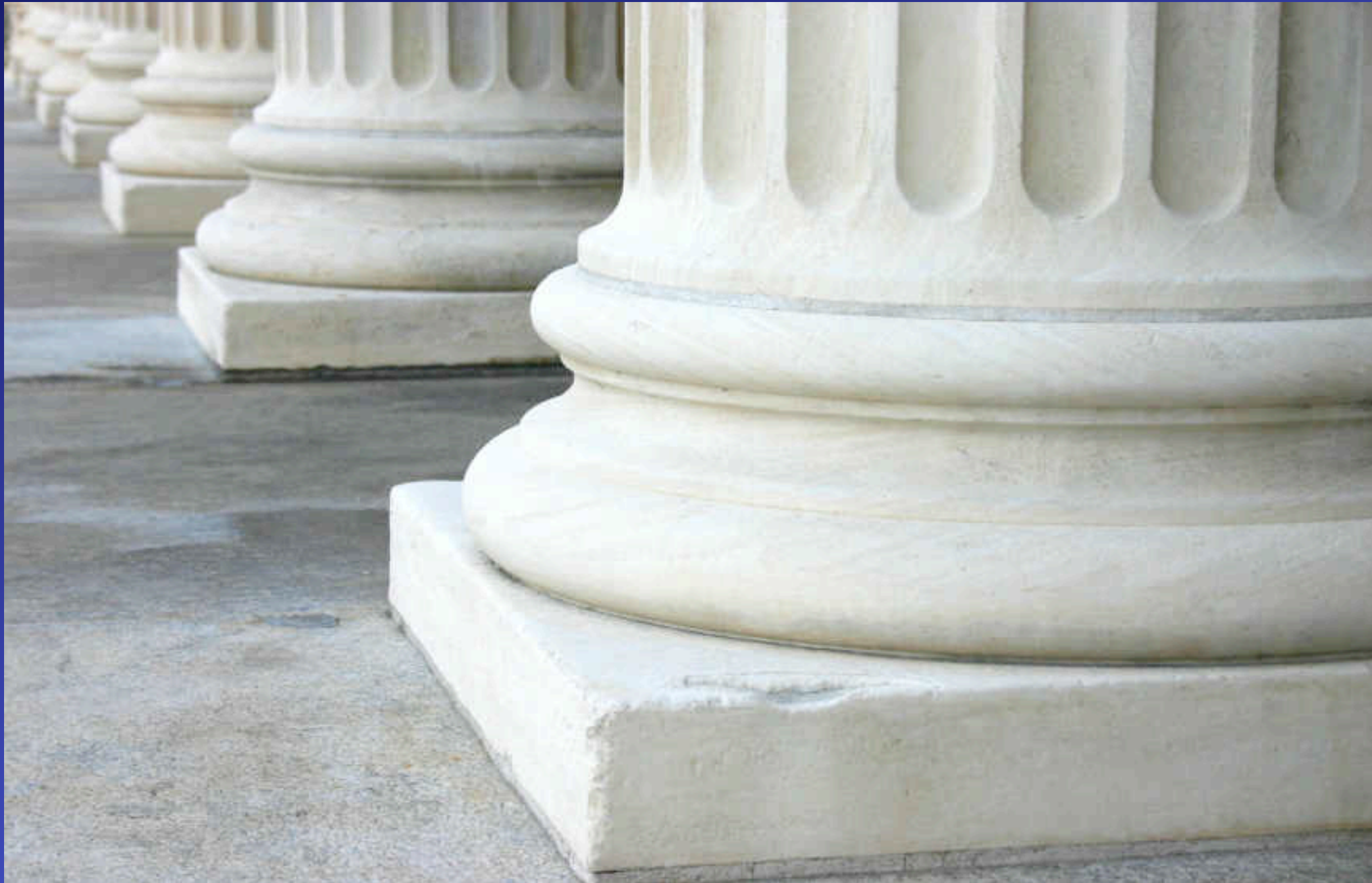
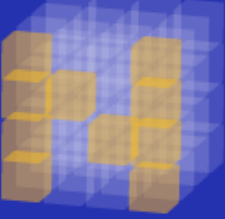
parallel mergesort with 4 threads



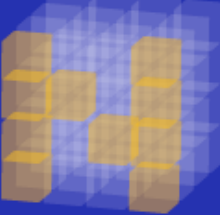


Over 50 SVN committers (about 15 very active)



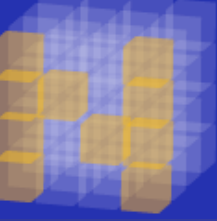


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Observations

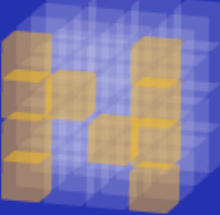




Observations

- Sharing code is addictive (like community theatre)
- Need the cathedral to bring the bazaar
- Be willing to let go of your code --- somebody out there can make it better than you did, let them when they gain your trust.

Thank you!!
I'm excited by what
we are building together!!



EuroSciPy
2008