Open GIScience

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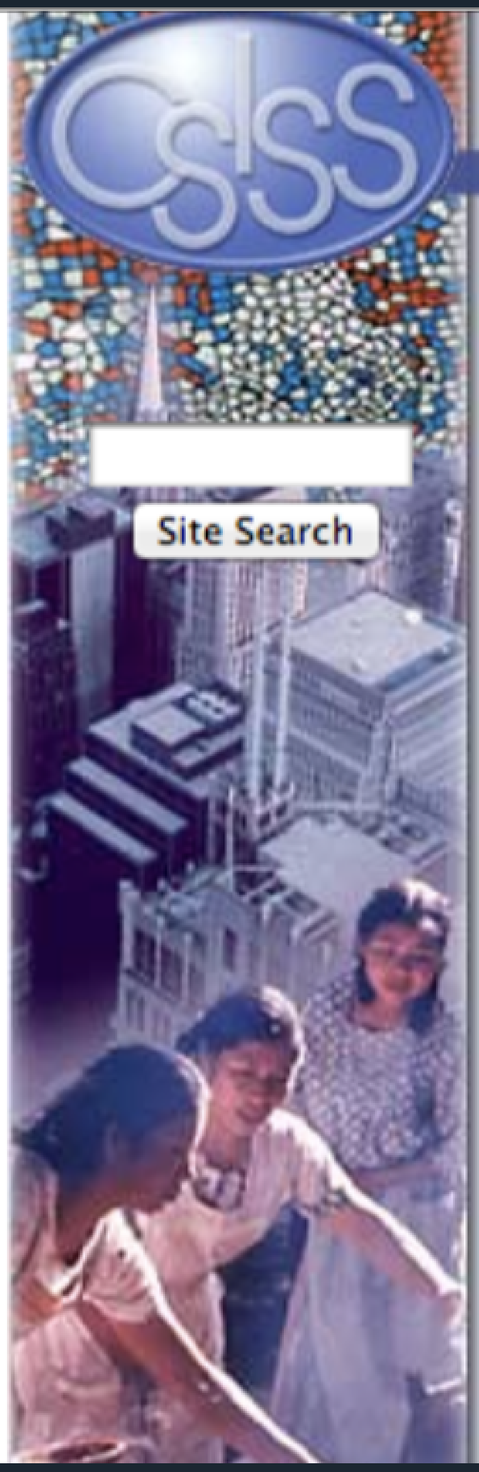
Center for Geospatial Sciences
University of California

Outline

- PySAL
- Open Revolution
- Bringing it home to GIScience
- Opportunities

PySAL

Python Spatial Analysis Library



Center for Spatially Integrated Social Science

Specialist Meeting on Spatial Data Analysis Software Tools

Dr. Sergio Rey, Organizer

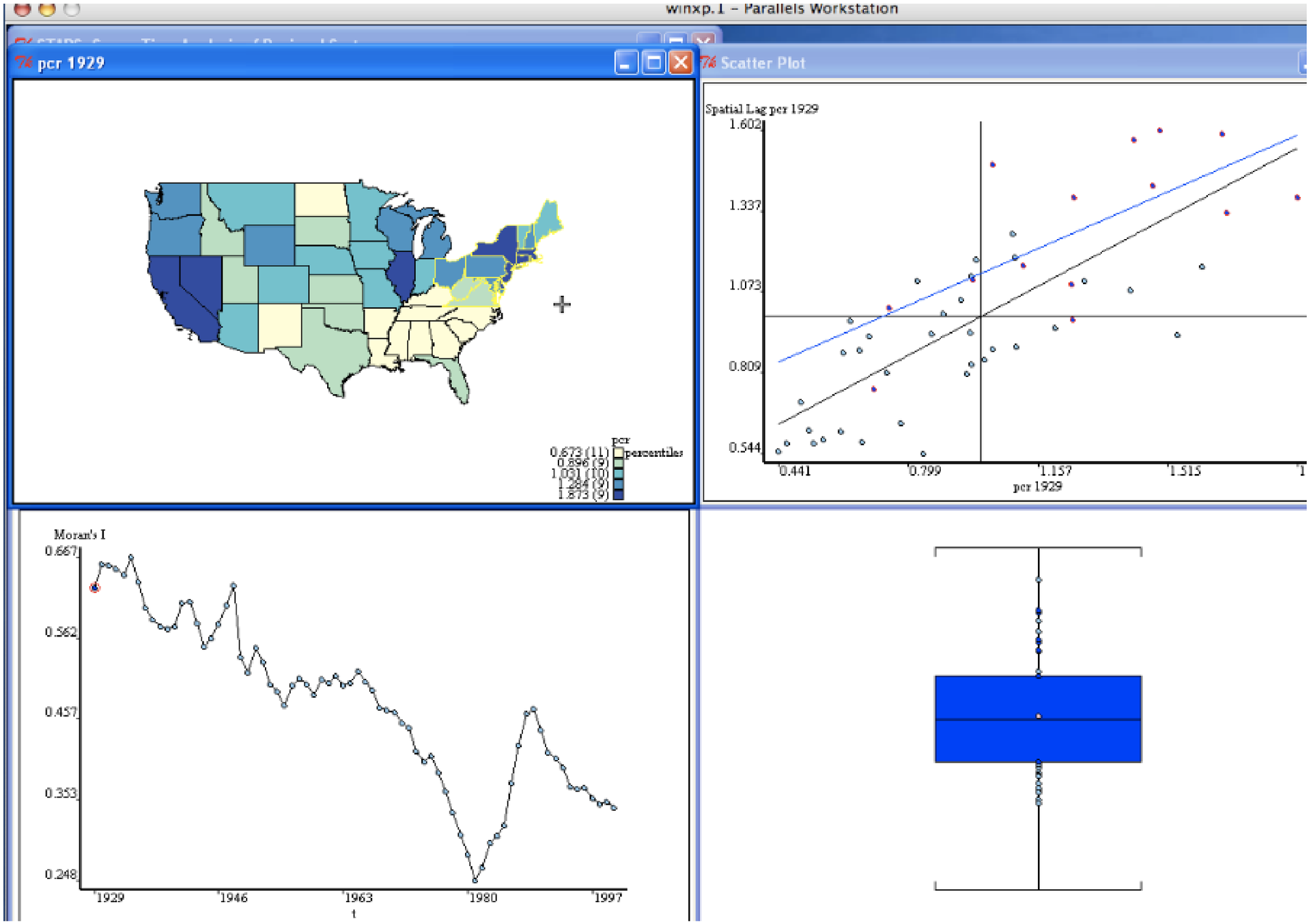
"This meeting will bring together software developers from both the public/academic sector as well as the private sector who deal with tools to visualize spatial data (geovisualization), carry out exploratory spatial data analysis (ESDA) and facilitate spatial modeling (spatial regression modeling, spatial econometrics, geostatistics), with a special focus on the potential for social science applications."

Dr. Luc Anselin, Organizer

Specialist Meeting on Spatial Data Analysis Software Tools
Upham Hotel, Santa Barbara, CA
May 10-11, 2002

STARS

Space-Time Analysis of Regional Systems: a package for exploratory space-time data analysis.



The current version of STARS is based on a refactoring to move from Numeric to Numpy. This version should work on the following platforms

- Linux
- Windows
- Mac

PySAL Objectives

- Leverage Existing Tools Development
  - GeoDa/PySpace
  - STARS
- Develop Core Library
  - spatial data *analytical* functions
  - enhanced specialization, modularity
  - fill void in geospatial Python libraries

Use Cases

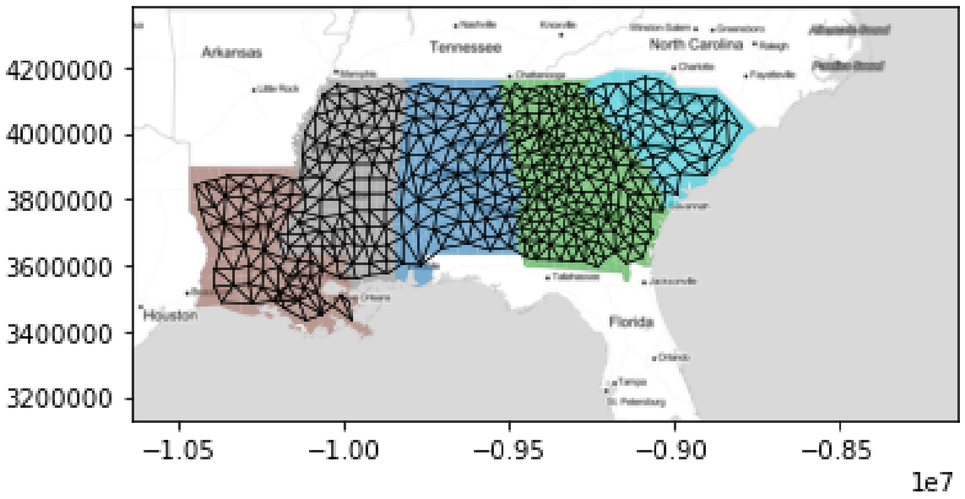
```
(gdsbook3) ~ » ipython
Python 3.5.5 | packaged by conda-forge | (default, Apr  6 2018, 13:43:56)
Type 'copyright', 'credits' or 'license' for more information
IPython 6.4.0 -- An enhanced Interactive Python. Type '?' for help.

In [1]: import pysal

In [2]: w = pysal.lat2W(10,10)

In [3]: w.n
Out[3]: 100

In [4]: w.pct_nonzero
Out[4]: 3.6
```

Here, we'll construct the Rook Contiguity graph (sometimes called the von Neuman neighborhood) for counties using the `libpysal.weights.Rook` constructor:

[19]:
```
w = libpysal.weights.Rook.from_dataframe(deep)
```

To see what this looks like, we can plot the graph below, where "connected" counties have a black line drawn between their centers:

[20]:
```
f,ax = w.plot(deep, edge_kws=dict(linewidth=.5),
              node_kws=dict(s=0))
deep.plot('STATE_NAME', ax=ax, alpha=.6)
ax.imshow(basemap, extent=extent, interpolation='bilinear')
plt.show()
```

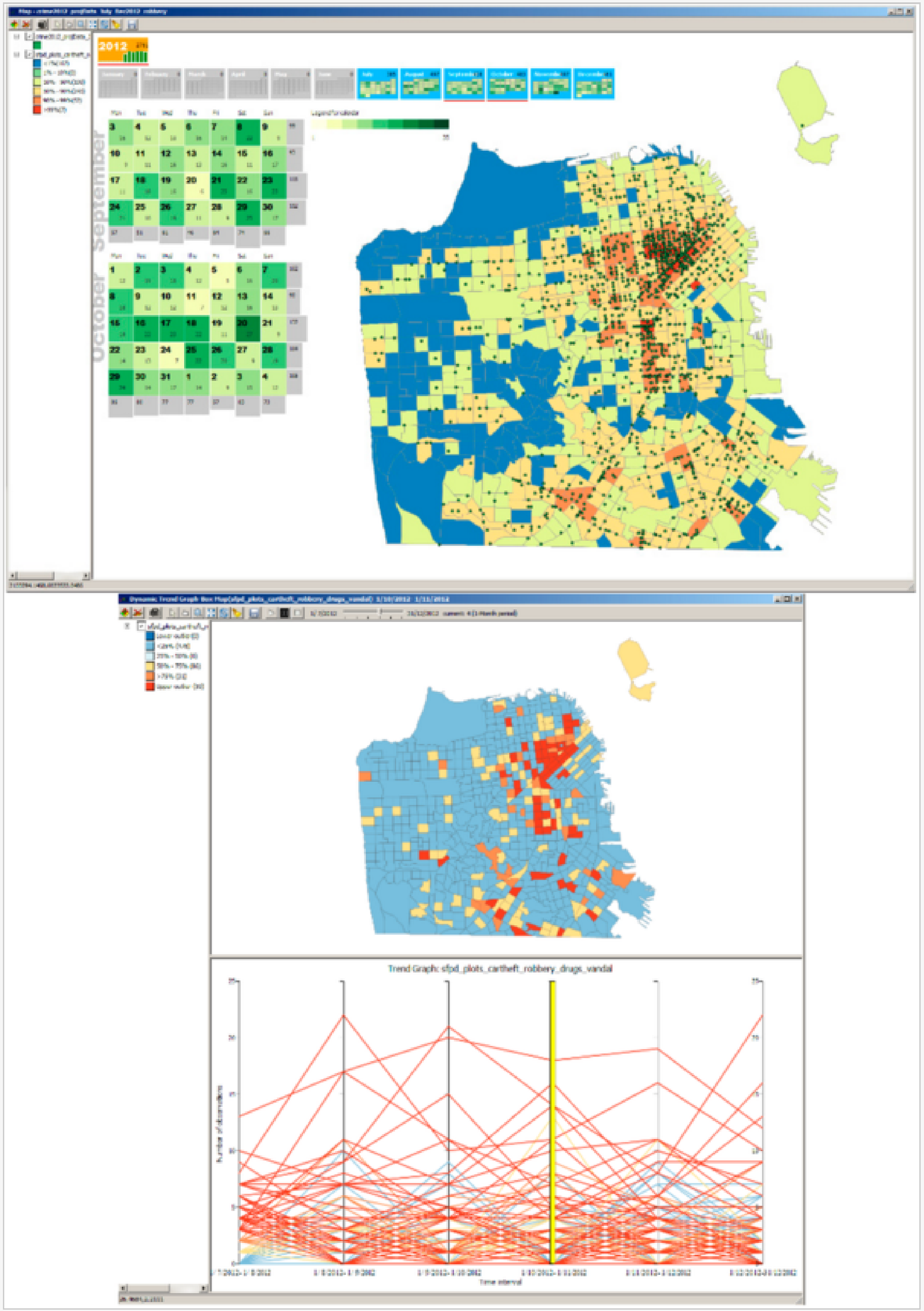


Path Silhouettes

The path silhouette models the joint geographical and feature dissimilarity between two observations as a *joint* spatial and social similarity:

$$d(i,j) = d_f(i,j) * d_s(i,j)$$

Figure 1. PySAL delivered as a stand-alone desktop application (CAST).



Untitled - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

Editor Layer:

Table Of Contents

Layers

ArcToolbox

- ArcToolbox
- 3D Analyst Tools
- Analysis Tools
- Cartography Tools
- Conversion Tools
- Data Interoperability Tools
- Data Management Tools
- Editing Tools
- Geocoding Tools
- Geostatistical Analyst Tools
- Linear Referencing Tools
- Multidimension Tools
- Network Analyst Tools
- Parcel Fabric Tools
- Python Spatial Analysis Library (PySAL)
  - Spatial Regression Tools
    - Ordinary Least Squares (OLS)
    - Spatial Error Model
    - Spatial Lag Model
  - Weight Tools
    - Conversion
      - Spatial Weight File Conversion
    - Creation
      - Create Adaptive Kernel Spatial Weights
      - Create Contiguity-Based Spatial Weights
      - Create Distance-Based Spatial Weights
    - Transformation
      - Application of Transformation

Spatial Lag Model

Input Data File

Input Spatial Weights

Output File Report (optional)

Dependent Variable (Y)

Independent Variables (X)

OK Cancel Environments... Show Help >>

Catalog

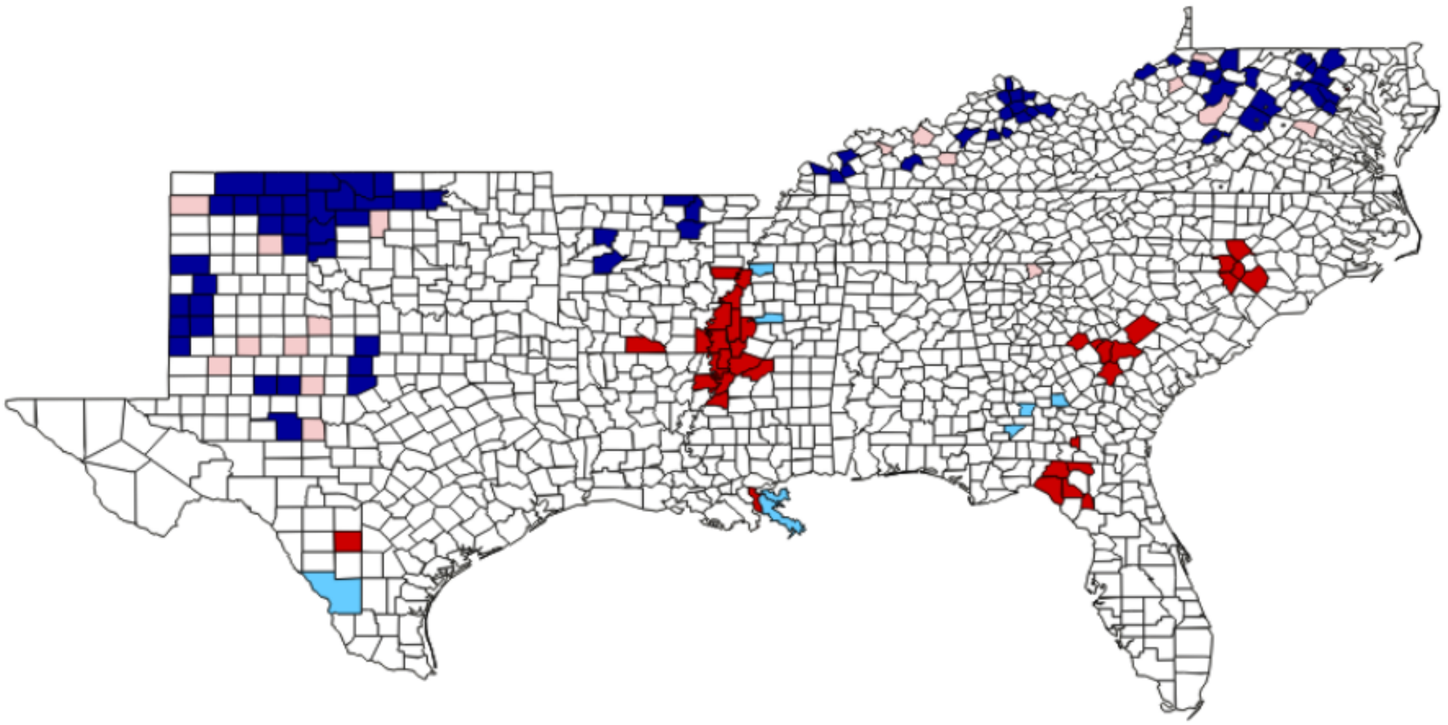
Browser

Add

- Home
- Favourites
- /
- /Volumes
- MSSQL
- PostGIS
- SpatiaLite
- OWS
- WCS
- WFS
- WMS

Layers

- morans output
  - /var/folders/r0/yh2mjk9547b8ytn...
    - not. sig
    - HH
    - LH
    - LL
    - HL
  - south



Processing Toolbox

Search...

- Recently used algorithms
  - choropleth
  - neighbors
  - local morans map
- Geoalgorithms
- Models [0 geoalgorithms]
- Scripts [8 geoalgorithms]
  - Inequality
  - Spatial statistics
    - choropleth
    - local g
    - local morans
    - local morans map
    - neighbors
  - Tools
  - User scripts

Simplified interface

Model Specification & Estimation

Open Model | Reset Model | Variable List | Preferences | Run

Specification

Drag and drop variables from the Variables panel. Double-click each variable to remove it.

Once the model is specified, click Run on toolbar or Next at bottom.

Y (Required)

HR90

YE

Instruments

R

T

X (Required, at least one variable)

HR80
DV90
BLK90
POL90

Estimation

Model Type

- (•) Standard
- ( ) Spatial Lag
- ( ) Spatial Error
- ( ) Spatial Lag+Error

Method

- (•) OLS
- ( ) GMM
- ( ) ML

Standard Errors

- [ ] White
- [ ] HAC
- [ ] KP HET

Variables

Search: Filter variables

Name

GI69
GI79
GI89
HC60
HC70
HC80
HC90
HR60
HR70
MA60
MA70
MA80
MA90
MFIL59
MFIL69
MFIL79
MFIL89
NOSOUTH
PO60
PO70
PO80
PO90
POL60
POL70
POL80
POLY_ID
PS60
PS70
PS80
PS90
RD60
RD70
RD80

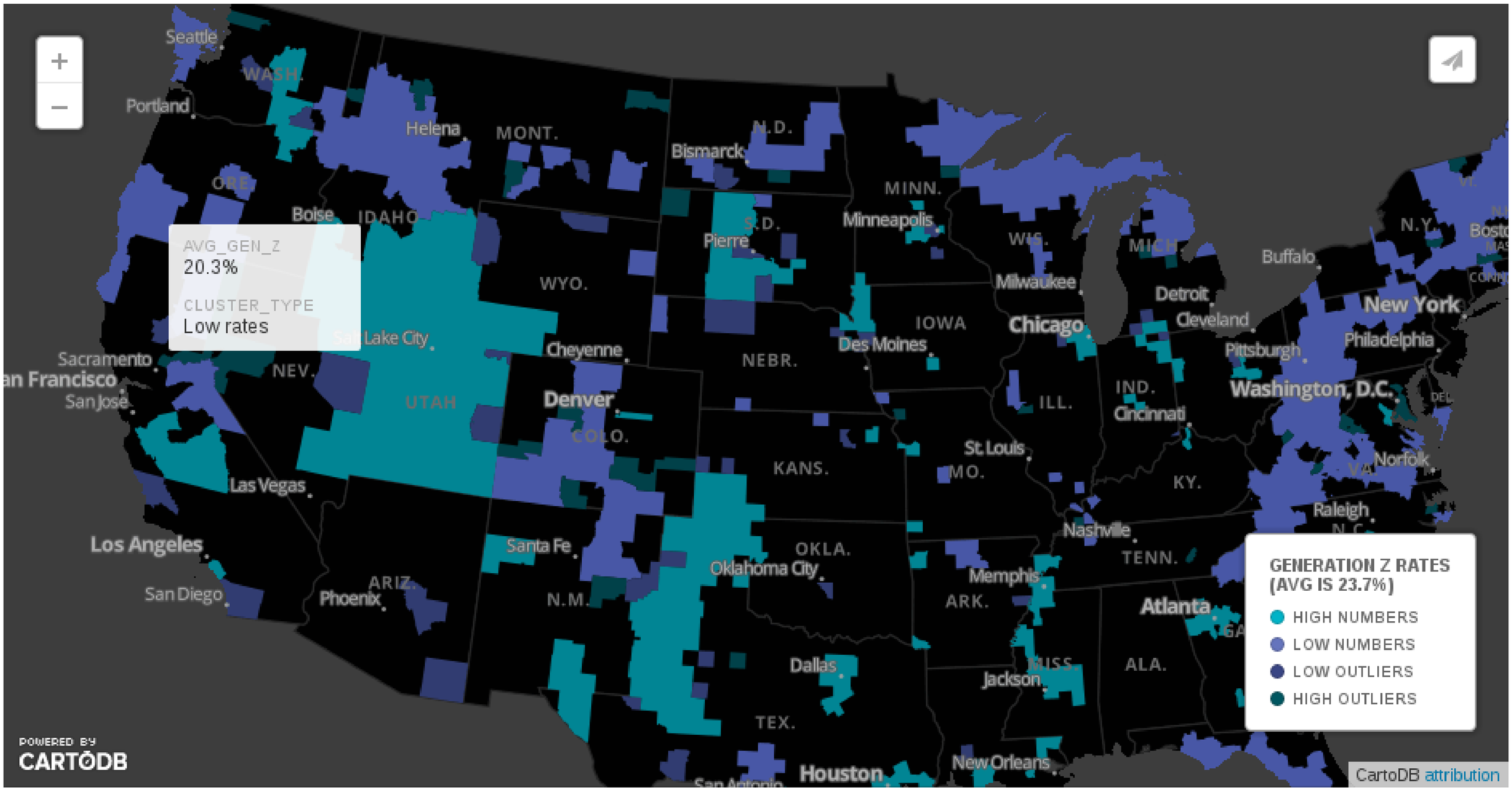
Previous | Next

Mar 9, 2016

Automatically Detecting Areas of Interest

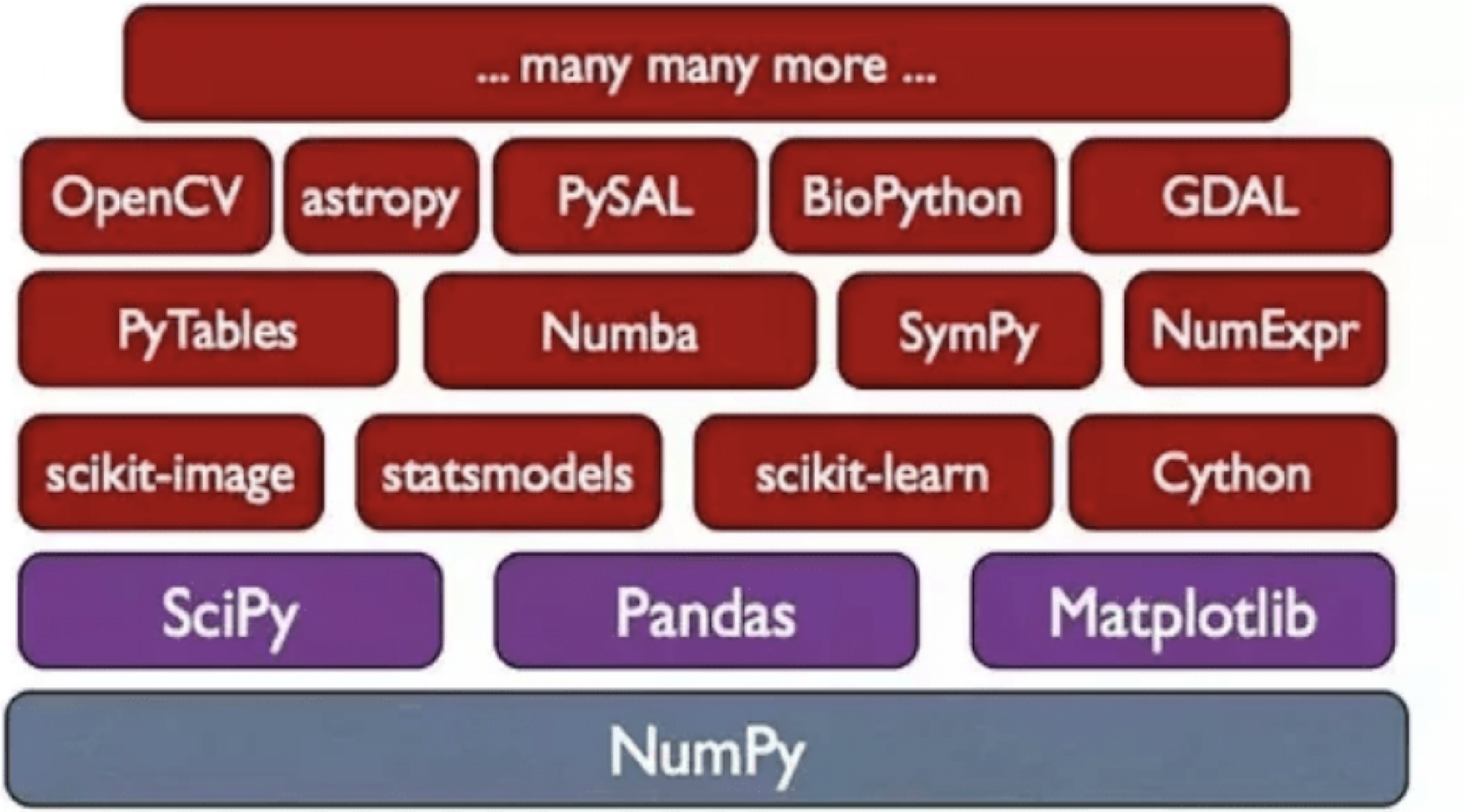
Research

by  Andy Eschbacher



Map created by  Andy Eschbacher

"How to prepare your data for machine learning in python"



http://angrybirdsriogame.info/?d=How+To+Prepare+Your+Data+For+Machine+Learning+in+Python

Presented by

CONTINUUM ANALYTICS

Previous topic

Anaconda Install

Next topic

Welcome to Continuum Documentation

This Page

Show Source

Quick search

Go

Enter search terms or a module, class or function name.

Packages included in Anaconda 1.3.1

- biopython 1.60
- bitarray 0.8.0
- bitey 0.0
- boto 2.7.0
- cairo 1.12.2 *L*
- conda 1.3.5
- cubes 0.10.1
- cython 0.17.4
- dateutil 1.5
- disco 0.4.4 *L*
- distribute 0.6.34
- docutils 0.10
- erlang R15B01 *L*
- flask 0.9
- freetype 2.4.10
- gdata 2.0.17
- gevent 0.13.8
- gevent-websocket 0.3.6
- gevent_zeromq 0.2.5
- googlecl 0.9.12
- greenlet 0.4.0
- grin 1.2.1
- h5py 2.1.1
- hdf5 1.8.9
- imaging 1.1.7
- iopro 1.3.2 *P*
- ipython 0.13.1
- jinja2 2.6
- libevent 2.0.20
- libnvvm 1.0 *P*
- libpng 1.5.13
- llvm 3.2
- llvmpy 0.10.2
- matplotlib 1.2.0
- mdp 3.3
- meta 0.4.2.dev
- mingw 4.7 *W*
- mkl 10.3 *LP*
- mpi4py 1.3 *L*
- mpich2 1.4.1p1 *L*
- networkx 1.7
- nltk 2.0.4
- nose 1.2.1
- numba 0.6.0
- numbapro 0.8.1 *P*
- numexpr 2.0.1
- numpy 1.6.2 *W*
- numpy 1.7.0rc1 *U*
- opencv 2.4.2 *L*
- pandas 0.10.1
- pip 1.2.1
- ply 3.4
- psutil 0.6.1
- py 1.4.12
- py2cairo 1.10.0 *L*
- pyaudio 0.2.7 *M*
- pycrypto 2.6
- pycurl 7.19.0
- pyflakes 0.5.0
- pygments 1.5
- pyparsing 1.5.6
- pysal 1.4.0
- pysam 0.6 *U*
- pyside 1.1.2
- pytables 2.4.0
- pytest 2.3.4
- python 2.7.3
- pytz 2012d
- pyyaml 3.10
- pyzmq 2.2.0.1
- qt 4.7.4
- redis 2.6.9 *U*
- redis-py 2.7.2 *U*
- requests 0.13.9
- scikit-learn 0.13
- scikits-image 0.7.1
- scipy 0.11.0
- sphinx 1.1.3
- spyder 2.1.13
- sqlalchemy 0.7.8
- statsmodels 0.4.3
- sympy 0.7.1
- theano 0.5.0 *L*
- tornado 2.4.1
- werkzeug 0.8.3
- wiserf 1.1 *UP*
- zeromq 2.2.0
- zlib 1.2.7

[Source: pysal]

Package: python-pysal (1.14.4-3)

Python Spatial Analysis Library - Python 2

PySAL is an open source library of spatial analysis functions written in Python intended to support the development of high level applications.

It is important to underscore what PySAL is, and is not, designed to do. First and foremost, PySAL is a library in the fullest sense of the word. Developers looking for a suite of spatial analytical methods that they can incorporate into application development should feel at home using PySAL. Spatial analysts who may be carrying out research projects requiring customized scripting, extensive simulation analysis, or those seeking to advance the state of the art in spatial analysis should also find PySAL to be a useful foundation for their work.

End users looking for a user friendly graphical user interface for spatial analysis should not turn to PySAL directly. Instead, they should consider projects like STARS and the GeoDaX suite of software products which wrap PySAL functionality in GUIs. At the same time, it's expected that with developments such as the Python based plug-in architectures for QGIS, GRASS, and the toolbox extensions for ArcGIS, that end user access to PySAL functionality will be widening in the near future.

This package contains the pysal library for Python 2.

Tags: Software Development: Python Development, Libraries, Implemented in: implemented-in::python, role::devel-lib

pysal

Summary

PyPI link	https://pypi.org/project/pysal
Total downloads	1,045,204
Total downloads - 30 days	24,270
Total downloads - 7 days	11,104

Badges

[![Downloads](https://pepy.tec

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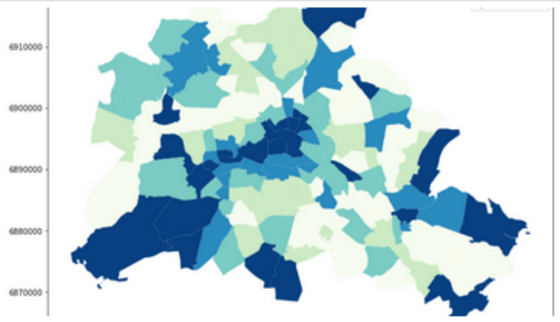
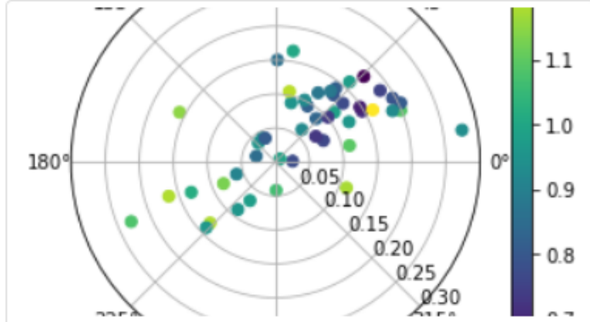
Last downloads

Date	Downloads
2020-01-27	730
2020-01-26	314
2020-01-25	356
2020-01-24	2,143



Housing Prices Berlin



Rose diagram (directional LISAs)

Visualizing Non Planar Neighbours

PySAL, the Python Spatial Analysis Library for open source, cross-platform geospatial data science.

NUMFOCUS [AFFILIATED PROJECT]

PySAL Components

lib

Core spatial data structures, file IO. Construction and interactive editing of spatial weights matrices & graphs. Alpha shapes, spatial indices, and spatial-topological relationships.

explore

Modules to conduct exploratory analysis of spatial and spatio-temporal data, including statistical testing on points, networks, and polygonal lattices. Also includes methods for spatial inequality and distributional dynamics.

model

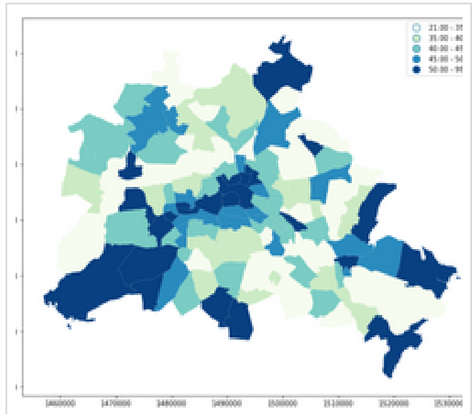
Estimation of spatial relationships in data with a variety of linear, generalized-linear, generalized-additive, and nonlinear models

viz

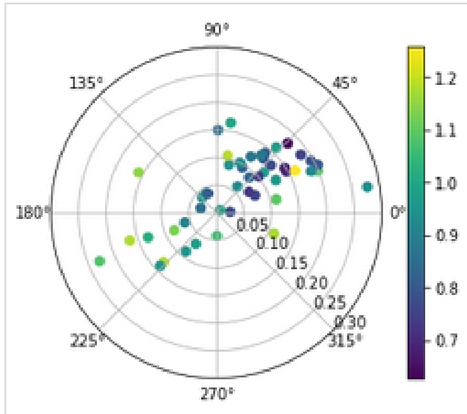
Visualize patterns in spatial data to detect clusters, outliers, and hot-spots.

PySAL Components

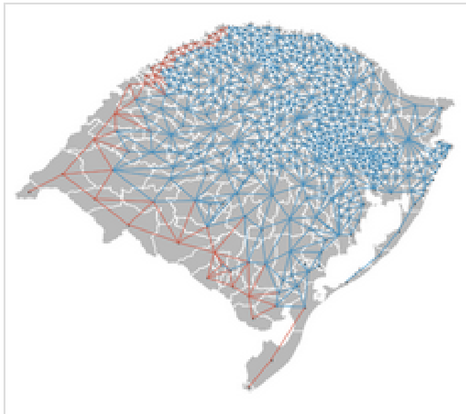
PySAL: Python Spatial Analysis Library



Housing Prices Berlin



Rose diagram (directional LISAs)



Visualizing Non Planar Neighbours

PySAL is an open source cross-platform library for geospatial data science with an emphasis on geospatial vector data written in Python. It supports the development of high level applications for spatial analysis, such as

- detection of spatial clusters, hot-spots, and outliers
- construction of graphs from spatial data
- spatial regression and statistical modeling on geographically embedded networks
- spatial econometrics
- exploratory spatio-temporal data analysis

PySAL Components

- **explore** - modules to conduct exploratory analysis of spatial and spatio-temporal data, including statistical testing on points, networks, and polygonal lattices. Also includes methods for spatial inequality, distributional dynamics, and segregation.
- **viz** - visualize patterns in spatial data to detect clusters, outliers, and hot-spots.
- **model** - model spatial relationships in data with a variety of linear, generalized-linear, generalized-additive, and nonlinear models.
- **lib** - solve a wide variety of computational geometry problems:
    - graph construction from polygonal lattices, lines, and points.
    - construction and interactive editing of spatial weights matrices & graphs
    - computation of alpha shapes, spatial indices, and spatial-topological relationships
    - reading and writing of sparse graph data, as well as pure python readers of spatial vector data.

Details are available in the PySAL api.

For background information see [RA07].

API Reference

`pysal.lib`: PySAL Core

- weights: Spatial Weights
- cg: Computational Geometry
- io: Input-Output
- examples: Example datasets

`pysal.explore`: Exploratory Spatial Data Analysis

- esda: Spatial Autocorrelation Analysis
- giddy: Geospatial Distribution Dynamics
- inequality: Spatial Inequality Analysis
- pointpats: Planar Point Pattern Analysis
- segregation: Segregation Analysis
- spaghetti: Spatial Analysis on Networks

`pysal.model`: Spatial Statistical Models

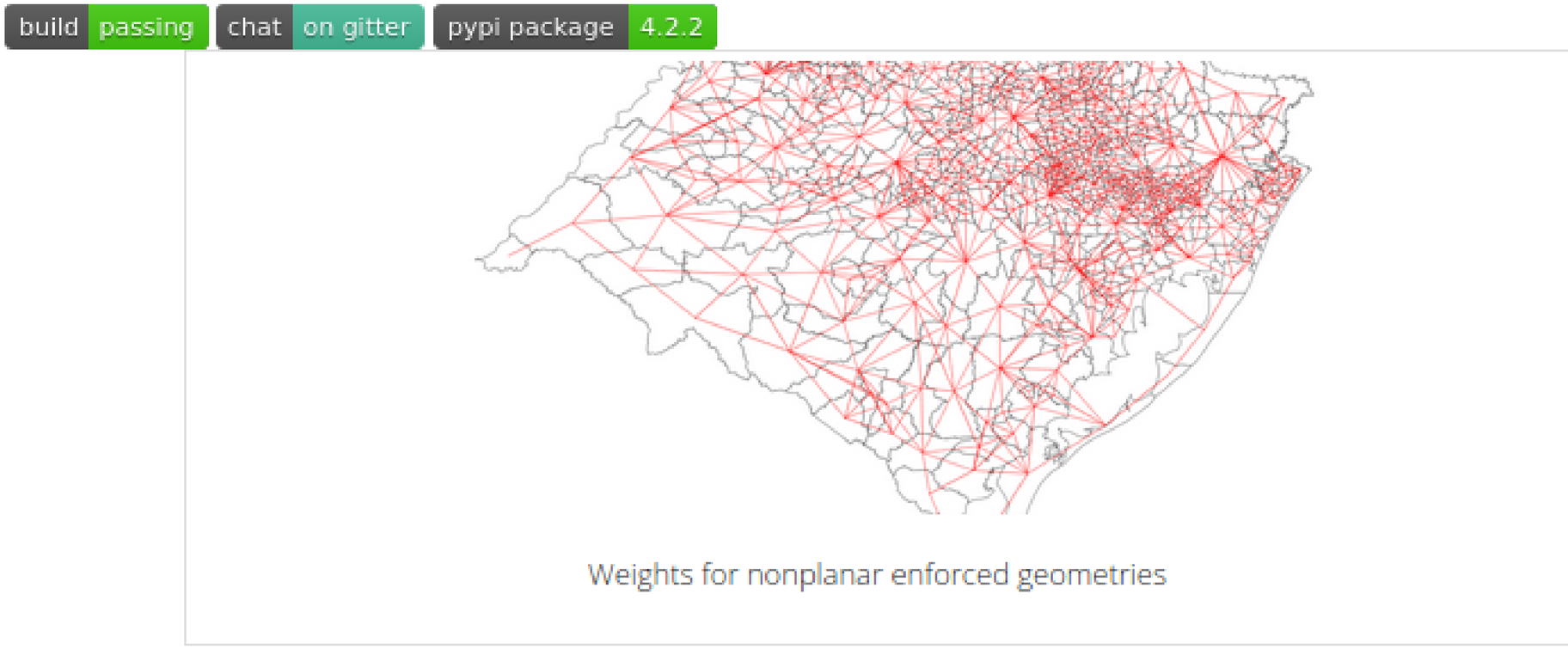
- mgwr: Multiscale Geographically Weighted Regression
- spglm: Sparse Generalized Linear Models
- spint: Spatial Interaction Modeling
- spreg: Spatial Regression and Econometrics
- spvcm: Spatial Varying Component Models
- tobler: Areal Interpolation and Dasymetric Mapping

`pysal.viz`: Geovisualization

- mapclassify: Choropleth Map Classification Schemes
- splot: Lightweight Visualization Interface for PySAL Analytics

lib: libpysal

libpysal: Python Spatial Analysis Library Core



Weights for nonplanar enforced geometries

Introduction

libpysal offers four modules that form the building blocks in many upstream packages in the PySAL family:

- Spatial Weights: libpysal.weights
- Input-and output: libpysal.io
- Computational geometry: libpysal.cg
- Built-in example datasets libpysal.examples

Examples demonstrating some of **libpysal** functionality are available in the tutorial.

Details are available in the libpysal api.

libpysal examples

- Example remote datasets
- Spatial Weights

PySAL: Explore

Explore

The `explore` layer includes modules to conduct exploratory analysis of spatial and spatio-temporal data. At a high level, packages in `explore` are focused on enabling the user to better understand patterns in the data and suggest new interesting questions rather than answer existing ones. They include methods to characterize the structure of spatial distributions (either on networks, in continuous space, or on polygonal lattices). In addition, this domain offers methods to examine the *dynamics* of these distributions, such as how their composition or spatial extent changes over time.

- esda : `esda` implements methods for the analysis of both global (map-wide) and local (focal) spatial autocorrelation, for both continuous and binary data. In addition, the package increasingly offers cutting-edge statistics about boundary strength and measures of aggregation error in statistical analyses

- giddy : `giddy` is an extension of `esda` to spatio-temporal data. The package hosts state-of-the-art methods that explicitly consider the role of space in the dynamics of distributions over time

- inequality : `inequality` provides indices for measuring inequality over space and time. These comprise classic measures such as the Theil *T* information index and the Gini index in mean deviation form; but also spatially-explicit measures that incorporate the location and spatial configuration of observations in the calculation of inequality measures.

- pointpats : `pointpats` supports the statistical analysis of point data, including methods to characterize the spatial structure of an observed point pattern: a collection of locations where some phenomena of interest have been recorded. This includes measures of centrography which provide overall geometric summaries of the point pattern, including central tendency, dispersion, intensity, and extent.

- segregation : `segregation` package calculates over 40 different segregation indices and provides a suite of additional features for measurement, visualization, and hypothesis testing that together represent the state-of-the-art in quantitative segregation analysis.

- spaghetti : `spaghetti` supports the the spatial analysis of graphs, networks, topology, and inference. It includes functionality for the statistical testing of clusters on networks, a robust all-to-all Dijkstra shortest path algorithm with multiprocessing functionality, and high-performance geometric and spatial computations using `geopandas` that are necessary for high-resolution interpolation along networks, and the ability to connect near-network observations onto the network

Explore examples

- Spatial Autocorrelation
- Geosilhouettes

PySAL: Model

Model

In contrast to `explore`, the `model` layer focuses on confirmatory analysis. In particular, its packages focus on the estimation of spatial relationships in data with a variety of linear, generalized-linear, generalized-additive, nonlinear, multi-level, and local regression models.

- mgwr : `mgwr` provides scalable algorithms for estimation, inference, and prediction using single- and multi-scale geographically-weighted regression models in a variety of generalized linear model frameworks, as well model diagnostics tools

- spglm : `spglm` implements a set of generalized linear regression techniques, including Gaussian, Poisson, and Logistic regression, that allow for sparse matrix operations in their computation and estimation to lower memory overhead and decreased computation time.

- spint : `spint` provides a collection of tools to study spatial interaction processes and analyze spatial interaction data. It includes functionality to facilitate the calibration and interpretation of a family of gravity-type spatial interaction models, including those with *production* constraints, *attraction* constraints, or a combination of the two.

- spreg : `spreg` supports the estimation of classic and spatial econometric models. Currently it contains methods for estimating standard Ordinary Least Squares (OLS), Two Stage Least Squares (2SLS) and Seemingly Unrelated Regressions (SUR), in addition to various tests of homokestadicity, normality, spatial randomness, and different types of spatial autocorrelation. It also includes a suite of tests for spatial dependence in models with binary dependent variables.

- spvcm : `spvcm` provides a general framework for estimating spatially-correlated variance components models. This class of models allows for spatial dependence in the variance components, so that nearby groups may affect one another. It also also provides a general-purpose framework for estimating models using Gibbs sampling in Python, accelerated by the `numba` package.

- tobler : `tobler` provides functionality for for areal interpolation and dasymetric mapping. Its name is an homage to the legendary geographer Waldo Tobler a pioneer of dozens of spatial analytical methods. `tobler` includes functionality for interpolating data using area-weighted approaches, regression model-based approaches that leverage remotely-sensed raster data as auxiliary information, and hybrid approaches.

Model examples

- Spatial Econometrics
- Geographically weighted regression

PySAL: viz

Viz

The `viz` layer provides functionality to support the creation of geovisualisations and visual representations of outputs from a variety of spatial analyses. Visualization plays a central role in modern spatial/geographic data science. Current packages provide classification methods for choropleth mapping and a common API for linking PySAL outputs to visualization tool-kits in the Python ecosystem.

- legendgram : `legendgram` is a small package that provides "legendgrams" legends that visualize the distribution of observations by color in a given map. These distributional visualizations for map classification schemes assist in analytical cartography and spatial data visualization

- mapclassify : `mapclassify` provides functionality for Choropleth map classification. Currently, fifteen different classification schemes are available, including a highly-optimized implementation of Fisher-Jenks optimal classification. Each scheme inherits a common structure that ensures computations are scalable and supports applications in streaming contexts.

- splot : `splot` provides statistical visualizations for spatial analysis. It methods for visualizing global and local spatial autocorrelation (through Moran scatterplots and cluster maps), temporal analysis of cluster dynamics (through heatmaps and rose diagrams), and multivariate choropleth mapping (through value-by-alpha maps. A high level API supports the creation of publication-ready visualizations

PySAL Future

- `import you`
- GSOC20
- dev meetings

Open Revolution

Currents

- PySAL has benefited from swimming in four interrelated currents
  - Open Source
  - Open Science
  - Open Education
  - Open Community

Open Source

Ballmer: I may have called Linux a cancer but now I love it

Former Microsoft chief Steve Ballmer once considered Linux users a bunch of communist thieves and saw open source itself as a cancer on Microsoft's intellectual property. But no more.

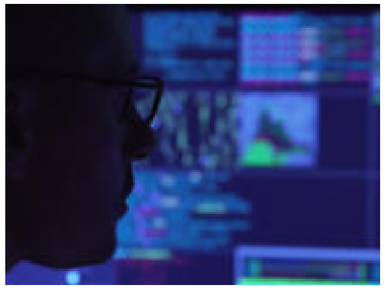
By Liam Tung | March 11, 2016 -- 12:22 GMT (04:22 PST) |
Topic: Enterprise Software

Ex-Microsoft CEO Steve Ballmer: Going to war with open source made Microsoft a ton of money.

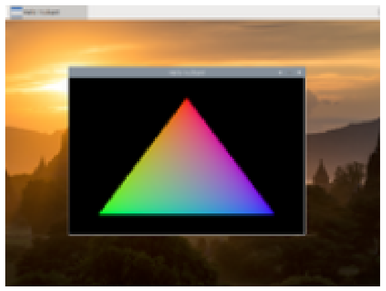
Image: Microsoft

Former Microsoft CEO Steve Ballmer no longer thinks Linux is a "malignant cancer".

MORE FROM LIAM TUNG



Enterprise Software
Data Windows 10 1909 sends to Microsoft can be totally shut off, but doing so is risky



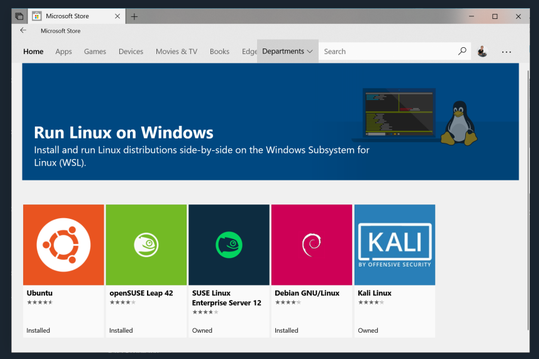
Hardware
Raspberry Pi 4 graphics win: Open-source Vulkan driver support is coming

Security
Windows 10 PCs get these new Intel chip security updates for Zombieload attacks

Enterprise Software
CERN: We're ditching Facebook Workplace. Here's why

Microsoft Linux Conference WSLconf Coming March 2020

by Chris Pietschmann | Sep 10, 2019 | Featured Articles, Infrastructure, Open Source


Microsoft Store
Microsoft Store
Home
Apps
Games
Devices
Movies & TV
Books
Edge
Departments
Search
Run Linux on Windows
Install and run Linux distributions side-by-side on the Windows Subsystem for Linux (WSL).
Ubuntu
Installed
openSUSE Leap 42
Installed
SUSE Linux Enterprise Server 12
Owned
Debian GNU/Linux
Installed
Kali Linux
Owned
KALI
BY OFFENSIVE SECURITY


Mac OS X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Operating System

Open Science

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Magazine

Reinhart, Rogoff... and Herndon: The student who caught out the profs

By Ruth Alexander
BBC News

20 April 2013

This week, economists have been astonished to find that a famous academic paper often used to make the case for austerity cuts contains major errors. Another surprise is that the mistakes, by two eminent Harvard professors, were spotted by a student doing his homework.

It's 4 January 2010, the Marriott Hotel in Atlanta. At the annual meeting of the American Economic Association, Professor Carmen Reinhart and the former chief economist of the International Monetary Fund, Ken Rogoff, are presenting a research paper called Growth in a Time of Debt.

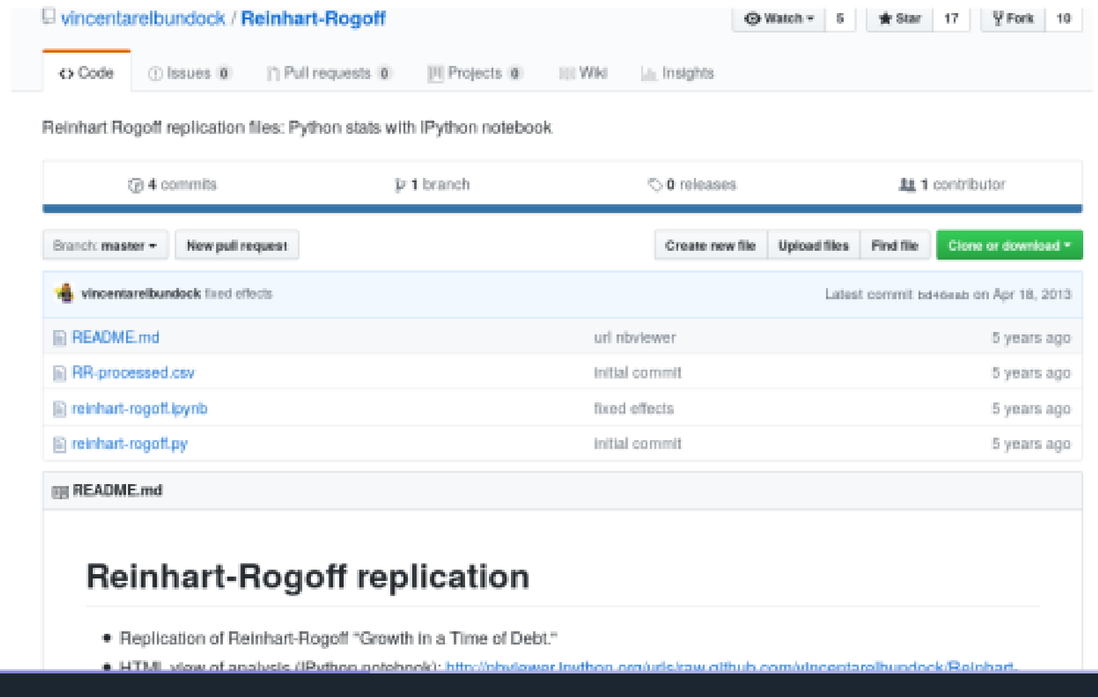
At a time of economic crisis, their finding resonates - economic growth slows dramatically when the size of a country's debt rises above 90% of Gross Domestic Product, the overall size of the economy

The Excel Depression

Paul Krugman APRIL 18, 2013 470

In this age of information, math errors can lead to disaster. NASA's Mars Orbiter crashed because engineers forgot to convert to metric measurements; JPMorgan Chase's "London Whale" venture went bad in part because modelers divided by a sum instead of an average. So, did an Excel coding error destroy the economies of the Western world?

The story so far: At the beginning of 2010, two Harvard economists, Carmen Reinhart and Kenneth Rogoff, circulated a paper, "Growth in a Time of Debt," that purported to identify a critical "threshold," a tipping point, for government indebtedness



vincentarelbundock / Reinhart-Rogoff

Watch 5 Star 17 Fork 10

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights

Reinhart Rogoff replication files: Python stats with IPython notebook

4 commits 1 branch 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

vincentarelbundock fixed effects Latest commit bd46eab on Apr 18, 2013

README.md	url nbviewer	5 years ago
RR-processed.csv	Initial commit	5 years ago
reinhart-rogoff.ipynb	fixed effects	5 years ago
reinhart-rogoff.py	Initial commit	5 years ago

README.md

Reinhart-Rogoff replication

- Replication of Reinhart-Rogoff "Growth In a Time of Debt."
- HTML view of analysis (IPython notebook): http://nbviewer.ipython.org/urls/raw.github.com/vincentarelbundock/Reinhart-

Proceedings of the Python in Science Conferences

ISSN: 2575-9752 https://doi.org/10.25080/issn.2575-9752

SciPy 2018 *17th Python in Science Conference - Austin, Texas (July 9 - 15, 2018)*

SciPy 2017 *16th Python in Science Conference - Austin, Texas (July 10 - 16, 2017)*

SciPy 2016 *15th Python in Science Conference - Austin, Texas (July 11 - 17, 2016)*

SciPy 2015 *14th Python in Science Conference - Austin, Texas (July 6 - 12, 2015)*

EuroSciPy 2014 *7th European Conference on Python in Science (EuroSciPy 2014) - Cambridge, UK (August 27 - 30, 2014)*

SciPy 2014 *13th Python in Science Conference - Austin, Texas (July 6 - 13, 2014)*

EuroSciPy 2013 *6th European Conference on Python in Science (EuroSciPy 2013) - Brussels, Belgium (August 21 - 25, 2013)*

SciPy 2013 *12th Python in Science Conference - Austin, Texas (June 24 - 29, 2013)*

SciPy 2012 *11th Python in Science Conference - Austin, Texas (July 16-21, 2012)*

SciPy 2011 *10th Python in Science Conference - Austin, Texas (July 11 - 16, 2011)*

SciPy 2010 *9th Python in Science Conference - Austin, Texas (June 28 - 30, 2010)*

SciPy 2009 *8th Python in Science Conference - Austin, Texas (August 18 - 23, 2009)*

SciPy 2008 *7th Python in Science Conference - Austin, Texas (June 28 - July 30, 2008)*

FatihAkici requested changes on Jun 19

View changes

Overall very good paper and tool. Thanks for your contribution to SciPy 2018! Other than a few comments that I left in-line, my two main comments regarding the overall quality of the paper are:

1. The title and abstract are too broad. It would be better both for the paper and reader if OSLNAP, the center of this paper, was mentioned in both title and abstract.
2. Figures are unreadable. Please make them bigger.

Thank you!

papers/serge_rey/serge_rey.rst — Hide outdated

```
24 +
25 +
26 + ----------------------------------------------------
27 + Spatio-temporal analysis of socioeconomic neighborhoods
```

FatihAkici on Jun 19 **Member**

Title is too broad. Since this is a paper on the OSLNAP tool, and not the analysis of socioeconomic neighborhoods per se, why not include that in the title?

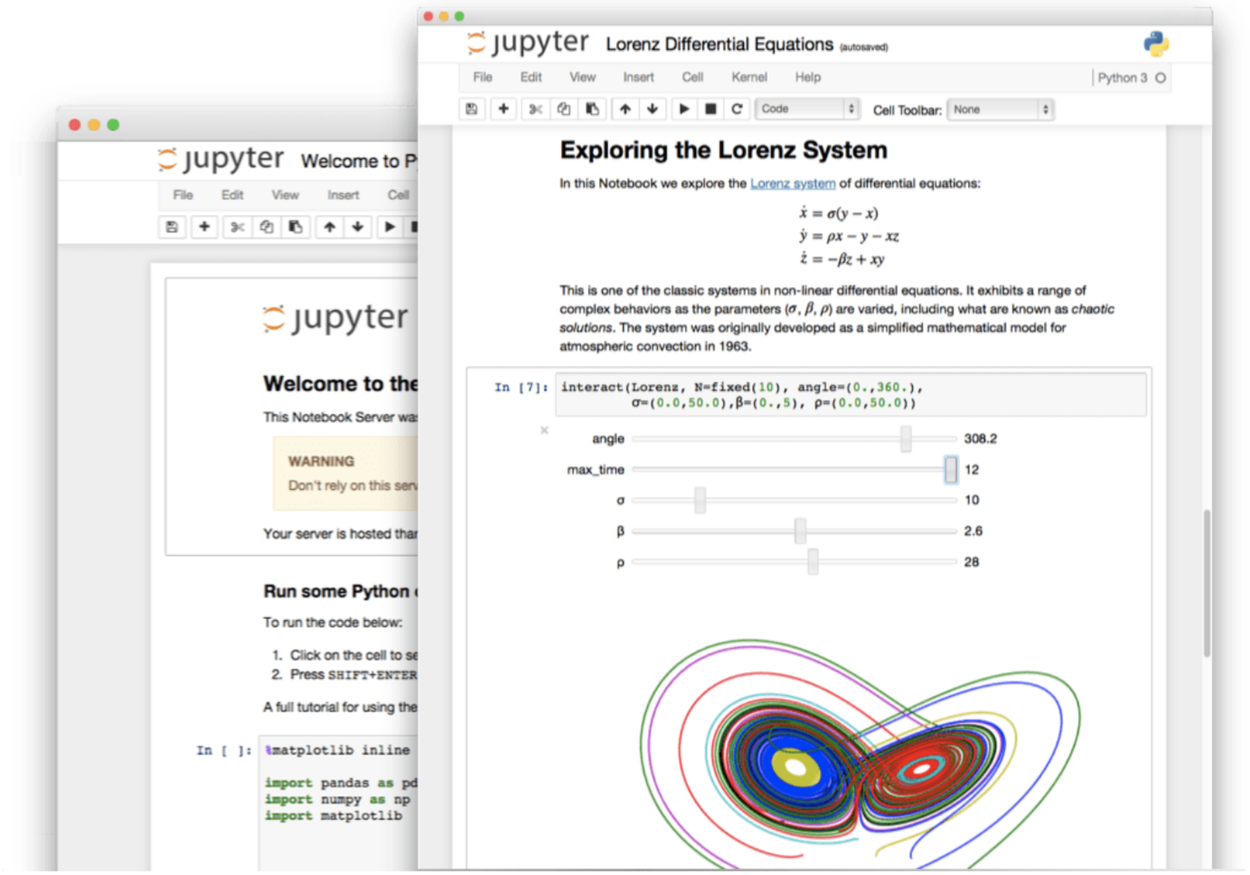
sjsrey on Jul 2 **Member**

Thank you for this suggestion. We agree that the title and abstract needed to be more explicitly linked to the tool, and we have changed both in this regard.

Reply…

papers/serge_rey/serge_rey.rst — Hide outdated

```
37 + dynamic lens, neighborhoods experience changes not only in their
    socioeconomic
38 + composition, but also in spatial extent; however, the literature has
    ignored the
39 + latter source of change. In this paper, we discuss the development of
    novel,
40 + spatially explicit approaches to the study of longitudinal neighborhood
    dynamics
```



The Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

Try it in your browser | Install the Notebook

</> Language of choice

Share notebooks

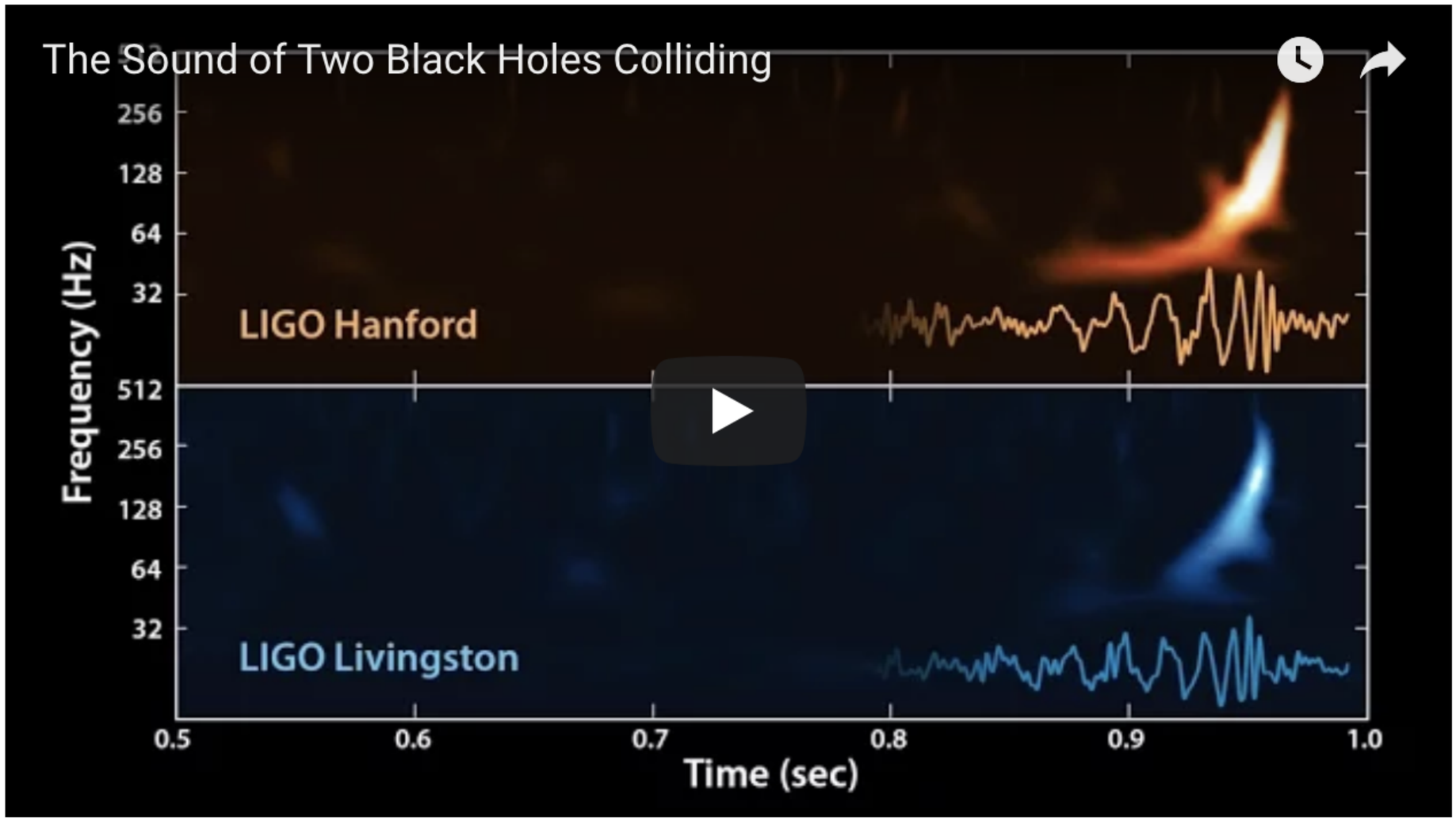
Interactive output

Spark Big data integration

The Scientific Paper Is Obsolete

Here's what's next.

The paper announcing the first confirmed detection of gravitational waves was published in the traditional way, as a PDF, but with a supplemental IPython notebook. The notebook walks through the work that generated every figure in the paper. Anyone who wants to can run the code for themselves, tweaking parts of it as they see fit, playing with the calculations to get a better handle on how each one works. At a certain point in the notebook, it gets to the part where the signal that generated the gravitational waves is processed into sound, and this you can play in your browser, hearing for yourself what the scientists heard first, the bloop of two black holes colliding.



Open Education

- access to quality education is everyone's birthright
- human knowledge is a public good that should be available to all
- human knowledge is a public good that we all can contribute to

THE CARPENTRIES

We teach foundational coding and data science skills to researchers worldwide.

What we do

The Carpentries teach foundational coding, and data science skills to researchers worldwide. Software Carpentry and Data Carpentry workshops are based on our lessons. Workshop hosts, Instructors, and learners must be prepared to follow our **Code of Conduct**.

More ›

Who we are

We are a diverse, global community of volunteer **Instructors**, helpers, **Trainers**, **Maintainers**, champions, **member organisations**, supporters, and **staff**. **Join us** at **CarpentryCon 2018** in Dublin, our key community-building and networking event this year.

More ›

Get involved

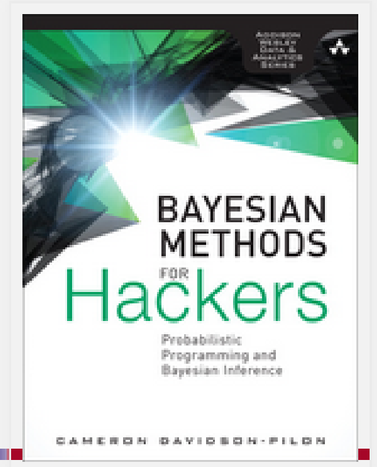
See all the **ways you can engage** with the Carpentries. Get information about upcoming events such as workshops, meetups, and discussions from our **community calendar**, or from our twice-monthly **newsletter**, *Carpentry Clippings*. Follow us on **Twitter**, **Facebook**, and **Slack**.

More ›

Printed version now available!

Bayesian Methods for Hackers is now available in print. You can pick up your copy at Amazon.

Differences between the print version and the online version include:



- Additional Chapter on Bayesian A/B testing
- Updated examples
- Answers to the end of chapter questions
- Additional explaination, and rewritten sections to aid the reader.

Contents

(The below chapters are rendered via the *nbviewer* at nbviewer.ipython.org/, and is read-only and rendered in real-time. Interactive notebooks + examples can be downloaded by cloning!

Prologue: Why we do it.

Chapter 1: Introduction to Bayesian Methods Introduction to the philosophy and practice of Bayesian methods and answering the question, "What is probabilistic programming?"

Chapter 2: A little more on PyMC We explore modeling Bayesian problems using Python's PyMC library through examples. How do we create Bayesian models?

Chapter 3: Opening the Black Box of MCMC We discuss how MCMC, Markov Chain Monte Carlo, operates and diagnostic tools.

Chapter 4: The Greatest Theorem Never Told We explore an incredibly useful, and dangerous, theorem: The Law of Large Numbers.

Chapter 5: Would you rather lose an arm or a leg? The introduction of loss functions and their (awesome) use in Bayesian methods.

Chapter 6: Getting our *prior*-ities straight Probably the most important chapter. We examine our prior choices and draw on expert opinions craft priors.

Open Community

SciPy Committee

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- Serge Rey, University of California, Riverside

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- Paul Ivanov, Bloomberg

Birds of a Feather:

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- Jessica Hamrick, Deep Mind

Proceedings:

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- Dillon Niederhut, Enthought
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- Machine Learning: Michelle Gill, Leland McInnes
- Materials Science: Jon Guyer, Jacqueline Cole
- Political and Social Sciences: Jackie Kazil, Levi Wolf

Sense of Ownership

4:30-5:00 pm	General	Data Visualization	Materials Science
	Yaksh: Facilitating Learning by Doing Zlotnik Ballroom Speaker: Prabhu Ramachandran, Enthought and IIT Bombay Speaker: Prathamesh Salunke, FOSSEE, IIT Bombay Speaker: Ankit Javalkar, FOSSEE, IIT Bombay Speaker: Aditya Palaparthy, FOSSEE, IIT Bombay Speaker: Mahesh Gudi, FOSSEE, IIT Bombay Speaker: Hardik Ghaghada, Ex FOSSEE, IIT Bombay	**PyViz: Unifying Python Tools for In-Browser Data Visualization** Room 204 Speaker: James A. Bednar, Solutions Architect, Anaconda, Inc. Speaker: Jean-Luc Stevens, Software Engineer, Anaconda, Inc. Speaker: Philipp Rudiger, Software Engineer, Anaconda, Inc. Speaker: Christopher Ball, Anaconda, Inc. Speaker: Bryan Van de Ven, Anaconda, Inc.	**Evolutionary Niching in the GAtor Genetic Algorithm for Molecular Crystal Structure Prediction** Room 203 Speaker: Timothy Rose, Carnegie Mellon University Author: Farren Curtis, Carnegie Mellon University Author: Xiayue Li, Google Author: Noa Marom, Carnegie Mellon University
5:00-6:00 pm	**Lightning Talks** Zlotnik Ballroom		
6:00-7:00 pm		**Available for an Impromptu BoF** Room 204	**SciPy 2019 BoF** Room 203

Sense of Belonging

SciPy 2018 Code of Conduct

SciPy is a community conference intended for networking and collaboration in the scientific Python developer community. We value the participation of each member of this community and want all attendees to have an enjoyable and fulfilling experience. Accordingly, all attendees are expected to show respect and courtesy to other attendees throughout the tutorials, the conference, the sprints, and at all conference events, whether officially sponsored by SciPy or not. Additionally, we expect participants to adhere to this code of conduct in our online spaces including Twitter and Slack. To make clear what is expected, all attendees, delegates, speakers, exhibitors and volunteers at any SciPy event are required to conform to the following Code of Conduct. Organizers will enforce this code throughout the event.

Overview

SciPy is dedicated to providing a harassment-free conference experience for everyone, regardless of age, gender, sexual orientation, disability, physical appearance, body size, race, or religion. We do not tolerate harassment of conference participants in any form. All communication should be appropriate for a professional audience including people of manydifferent backgrounds. Sexual language and imagery is not appropriate for any conference venue, including talks. Be inclusive and respectful. Be kind to others. Do not insult or put down other attendees. Behave professionally. Remember that harassment and sexist, racist, transphobic, or exclusionary jokes are not appropriate for SciPy.
Attendees violating these rules may be asked to leave the conference without a refund at the sole discretion of the conference organizers.

Thank you for helping make this a welcoming, friendly event for all.

Details

Harassment includes offensive verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, sexual images in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention including, but not limited to, flirting and propositioning an attendee. Remember, this is a scientific conference, not a social venue. Belittling comments such as, "This is obvious/easy. Everyone knows this.", and "well actually" are all inappropriate. Questions for the speaker should include an actual question. Participants asked to stop any harassing behavior are expected to comply immediately. Exhibitors in the expo hall, sponsor or vendor booths, or similar activities are also subject to the anti-harassment policy. In particular, exhibitors should not use sexualized images, activities, or other material. Booth staff (including volunteers) should not use sexualized clothing/uniforms/costumes, or otherwise create a sexualized environment. Be careful in the words that you choose. Remember that sexist, racist, transphobic, and other exclusionary jokes can be offensive to those around you. Excessive swearing and offensive jokes are not appropriate for SciPy.

If you have experienced or witnessed a code of conduct violation, we strongly encourage you to contact the conference chairs, Serge Rey and Prabhu Ramachandran, the diversity chairs, Julie Hollek and Jackie Kazil, or any other conference organizer either in person or over Slack, as we want everyone to feel safe during SciPy events. The conference chairs will be introduced at the beginning of the conference and will be identifiable by badge. If a participant engages in behavior that violates this code of conduct, the conference organizers may take any action they deem appropriate, including warning the offender or expulsion from the conference with no refund.

Contact Information

If you are being harassed, notice that someone else is being harassed, or have any other concerns, please contact a member of conference staff or a conference volunteer. You may also email SciPy@enthought.com or call (512) 423-2756 to get a message to the conference chairs.

The conference staff will be happy to help participants contact hotel/venue security or local law enforcement, provide escorts, or otherwise assist those experiencing harassment to feel safe for the duration of the conference. We value your attendance.

Gil Forsyth
@gilforsyth

Follow

The #SciPy2018 attendees pay homage to the great @gvanrossum and wish him a relaxing vacation!

4:16 PM - 13 Jul 2018

187 Retweets **501** Likes

7 187 501

Tweet your reply

Guido van Rossum @gvanrossum · Jul 13

Replying to @gilforsyth

Awww.... :-)

Bringing it home to GIScience

First Generation (2000-2010)

- Jim LeSage: Spatial Econometrics Toolbox
- Paul Waddell: UrbanSim
- Roger Bivand: spdep
- Helena Mitasova: GRASS

Second Generation

GDS17 Home Overview Syllabus Lectures Labs Assessment Resources

ENVS363/563

Geographic Data Science

Welcome to Geographic Data Science, a course taught by Dr. Dani Arribas-Bel in the Autumn of 2017 at the University of Liverpool.

The timetable for the course is:

- **Lectures**: *Mondays* 9:00am-10:00am, `CTH-LTC`
- **Computer Labs**: *Mondays* 11:00am-1:00pm, `ENG-HHTC`

Locations

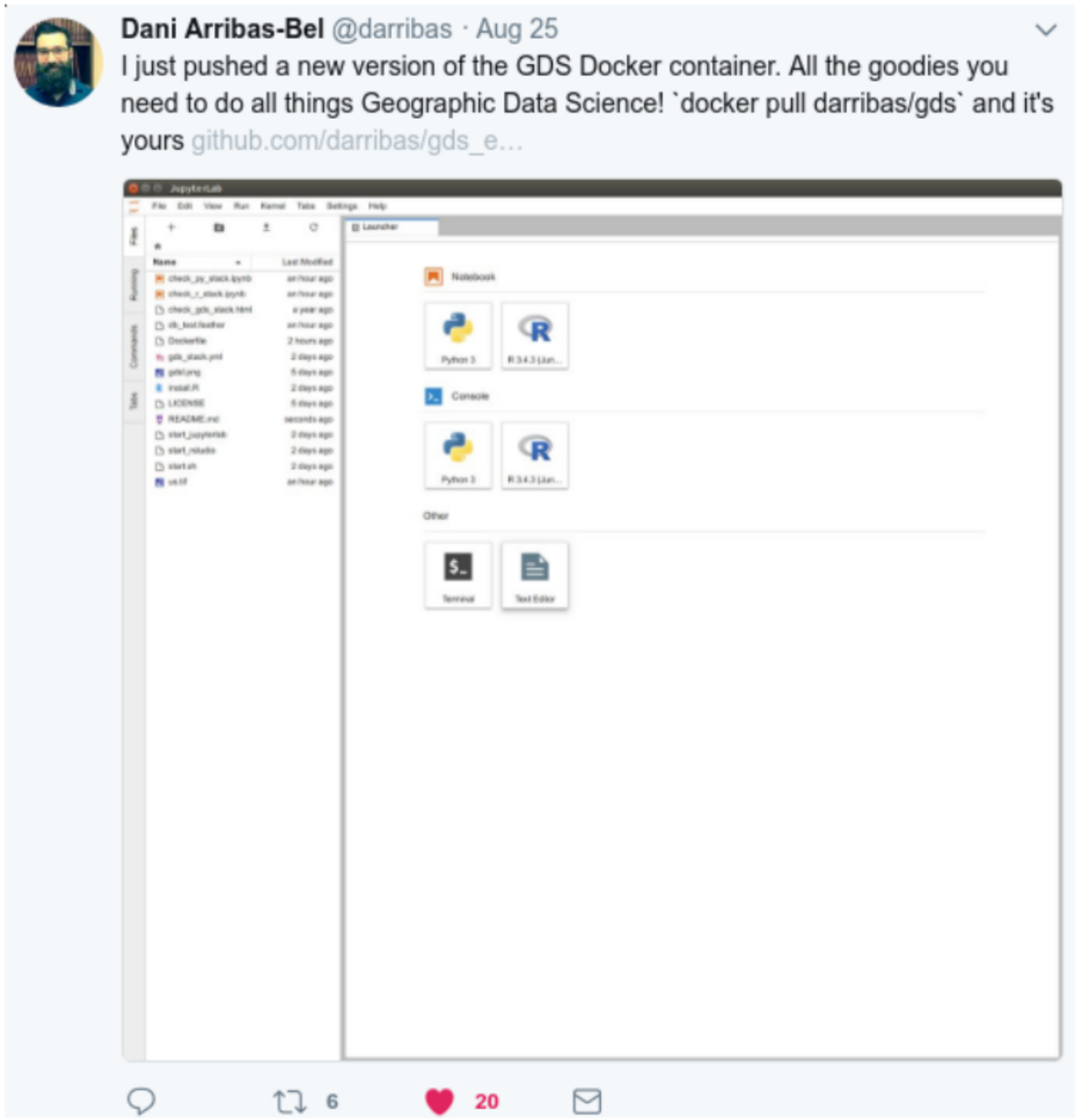
- `CTH-LTC`: Central Teaching Hub - Lecture Theatre C [Map]
- `ENG-HHTC`: Harrison Hughes Building (Engineering), Computer lab (top floor) [Map]

Contact

> Dani Arribas-Bel - `D.Arribas-Bel [at] liverpool.ac.uk` Lecturer in Geographic Data Science Office 508, Roxby Building, University of Liverpool - 74 Bedford St S, Liverpool, L69 7ZT, United Kingdom.

Module Handbook

A pdf copy of the module handbook can be downloaded here.



CenPy

build passing

An interface to explore and query the US Census API and return Pandas Dataframes. Ideally, this package is intended for exploratory data analysis and draws inspiration from sqlalchemy-like interfaces and `acs.R`.

An intro notebook is available.

Also, a great example on how to grab work with cenpy, moving from nothing to data to map, is here, by @dfolch.

Installation

This package depends on Pandas and requests. You can install `cenpy` and other dependencies using `pip`:

```
pip install cenpy
```

If you do not have `pip`, simply copy the module somewhere in your python path.

Usage

Once done, importing `cenpy` will provide the `explorer` and `base` modules. To create a connection:

```
cxn = cenpy.base.Connection('2010sf1')
```

Check the variables required and geographies supported:

```
cxn.variables #is a pandas dataframe containing query-able vbls
cxn.geographies #is a pandas dataframe containing query-able geographies
```

nature.com > scientific data > data descriptors > article

MENU SCIENTIFIC DATA

Data Descriptor | OPEN | Published: 15 August 2017

Spatiotemporal database of US congressional elections, 1896–2014

Levi John Wolf

Scientific Data **4**, Article number: 170108 (2017) | Download Citation

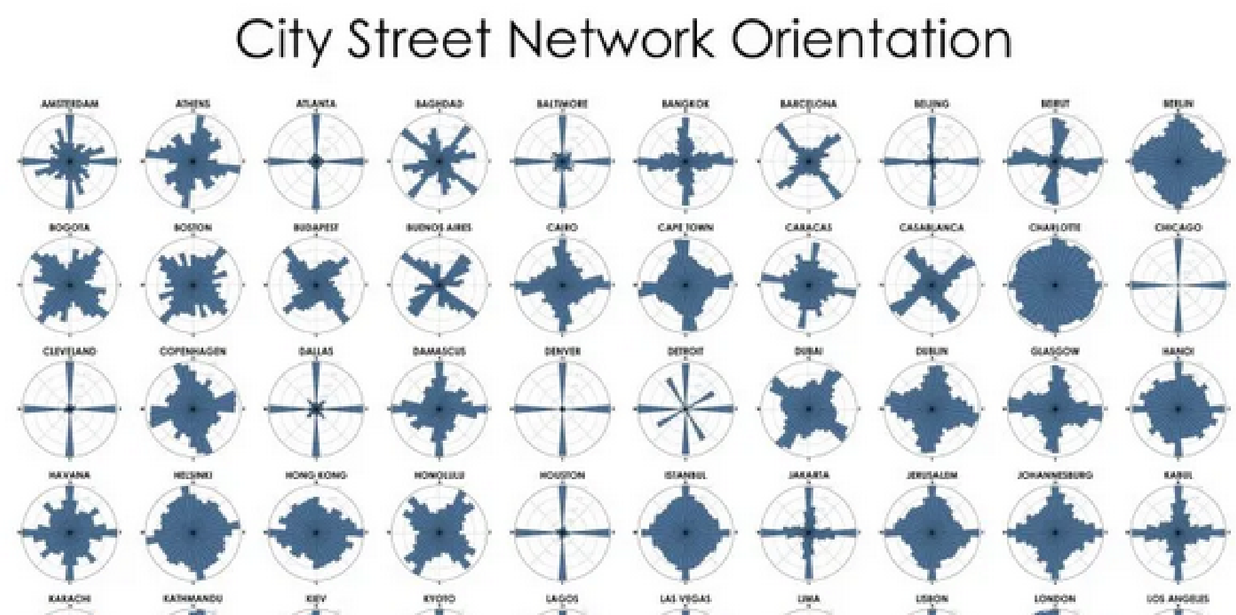
Abstract

High-quality historical data about US Congressional elections has long provided common ground for electoral studies. However, advances in geographic information science have recently made it efficient to compile, distribute, and analyze large spatio-temporal data sets on the structure of US Congressional districts. A single spatio-temporal data set that relates US Congressional election results to the spatial extent of the constituencies has not yet been developed. To address this, existing high-quality data sets of elections returns were combined with a spatiotemporal data set on Congressional district boundaries to generate a new spatio-temporal database of US Congressional election results that are explicitly linked to the geospatial data about the districts themselves.

Urban Street Network Orientation

By gboeing 2019-09-09 12 Comments

My new article, Urban Spatial Order: Street Network Orientation, Configuration, and Entropy, has just been published in one of my favorite journals: *Applied Network Science* (download free PDF). This study explores the spatial signatures of urban evolution and central planning. It examines street network orientation, connectivity, granularity, and entropy in 100 cities around the world using OpenStreetMap data and OSMnx for modeling and visualization:



Challenges

LEARNING

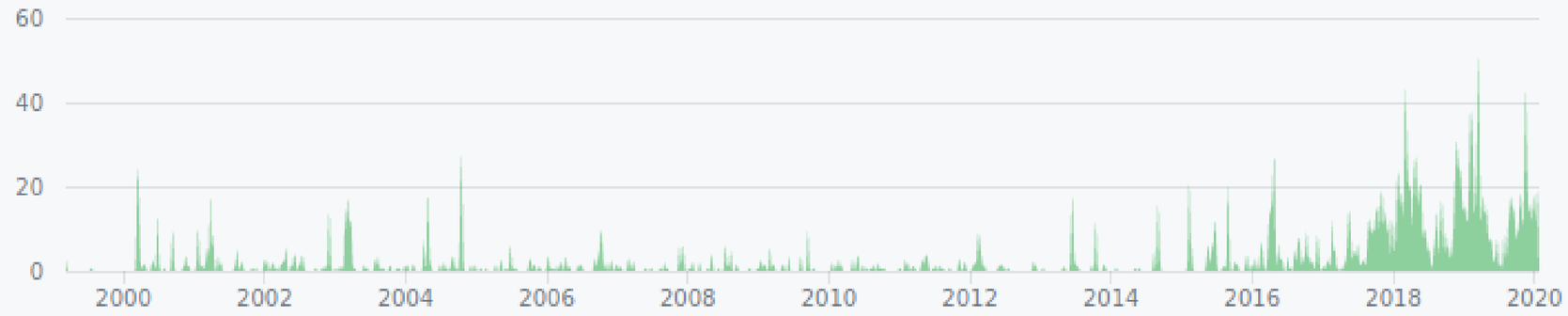
Roads and Bridges: The Unseen Labor Behind Our Digital Infrastructure

Pulse
Contributors
Community
Commits
Code frequency
Dependency graph
Network
Forks

Mar 14, 1999 – Feb 3, 2020

Contributions: **Commits**

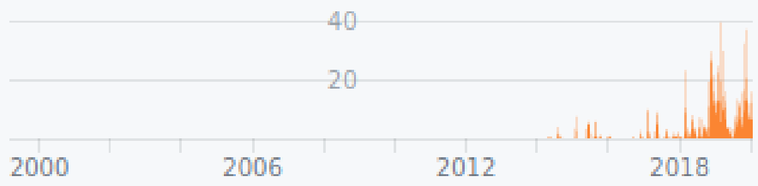
Contributions to master, excluding merge commits



rouault

#1

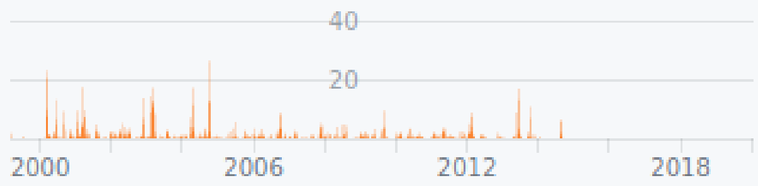
1,023 commits 530,614 ++ 294,498 --



warmerdam

#2

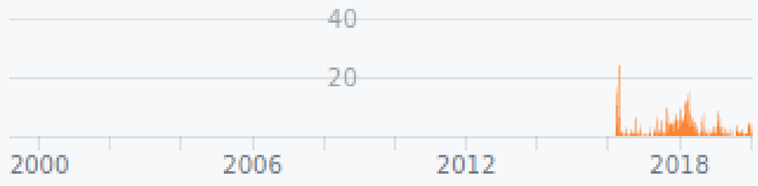
897 commits 233,009 ++ 118,042 --



kbevers

#3

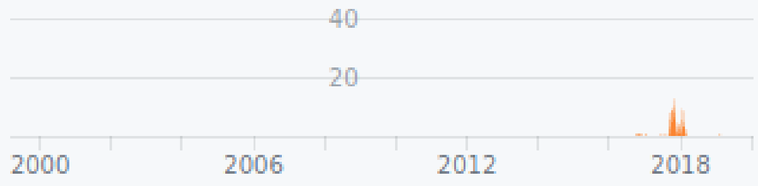
601 commits 83,904 ++ 49,931 --



busstoptaktik

#4

135 commits 30,513 ++ 24,917 --



Slow engagement

J Geogr Syst (2009) 11:191–207
DOI 10.1007/s10109-009-0086-8

ORIGINAL ARTICLE

Show me the code: spatial analysis and open source

Sergio J. Rey

Our GIS is too small

Mark Gahegan

First published:28 December 2017 | https://doi.org/10.1111/cag.12434 | Citations: 3

UC-eLinks

Abstract

EN FR

GIScience and GISystems have been successful in tackling many geographical problems over the last 30 years. But technologies and associated theory can become limiting if they end up defining how we see the world and what we believe are worthy and tractable research problems. This paper explores some of the limitations currently impacting GISystems and GIScience from the perspective of technology and community, contrasting GIScience with other informatics communities and their practices. It explores several themes: (i) GIScience and the informatics revolution; (ii) the lack of a community-owned innovation platform for GIScience research; (iii) the computational limitations imposed by desktop computing and the inability to scale up analysis; (iv) the continued failure to support the temporal dimension, and especially dynamic processes and models with feedbacks; (v) the challenge of embracing a wider and more heterogeneous view of geographical representation and analysis; and (vi) the urgent need to foster an active software development community to redress some of these shortcomings. A brief discussion then summarizes the issues and suggests that GIScience needs to work harder as a community to become more relevant to the broader geographic field and meet a bigger set of representation, analysis, and modelling needs.

Incentives and Attribution

Core Developers

(in alphabetical order)

Pedro Amaral

Universidade Federal de Minas Gerais
@pedrovma on GitHub

Luc Anselin

University of Chicago
@lanselin on GitHub

Dani Arribas-Bel

University of Liverpool
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Renan Cortes

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@renanxcortes on GitHub

James Gaboardi

Penn State University
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Wei Kang

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Elijah Knaap

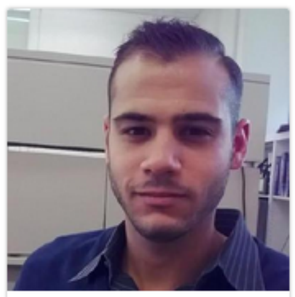
UC Riverside
@knaaptime on GitHub

Ziqi Li

Arizona State University
@Ziqi-Li on GitHub

Stefanie Lumnitz

University of British Columbia
@slumnitz on GitHub



Taylor Oshan

University of Maryland
@tayloroshan on GitHub

Serge Rey

UC Riverside
@sjsrey on GitHub

Hu Shao

esri
@shaohu on GitHub

Philip Stephens

Arizona State University
@pastephens on GitHub

Ran Wei

UC Riverside
@rwei5 on GitHub

Levi Wolf

University of Bristol
@ljwolf on GitHub

refactor

Sergio Rey edited this page on Dec 13, 2016 · 4 revisions

PEP 12: Refactor PySAL Code Base

PEP	12
Title	Refactor PySAL Code Base
Author	Serge Rey
Status	Draft
Type	Infrastructure
Created	2016-11-28
Post-History	2016-11-28

Contents

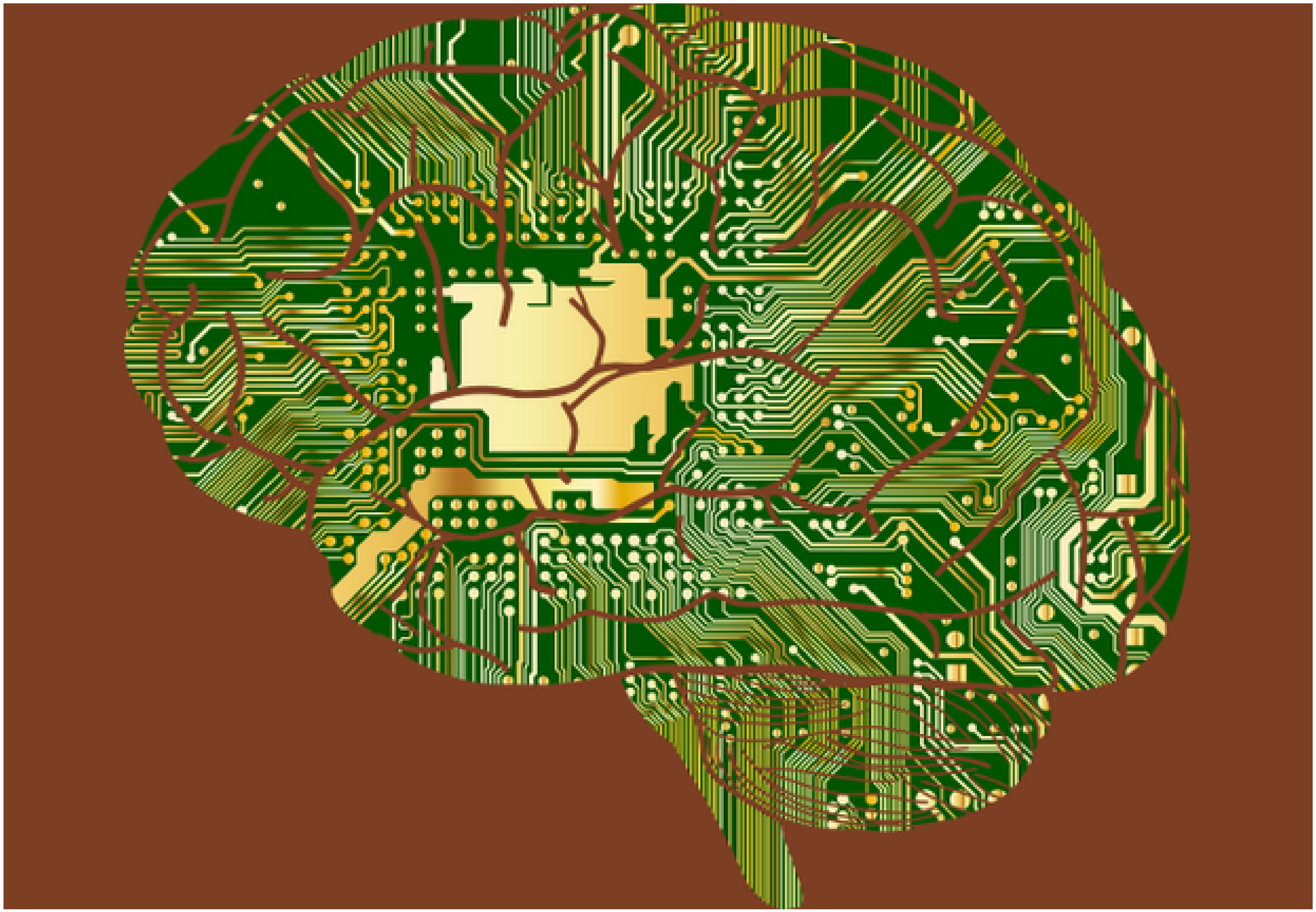
Disincentives are still here

- 1996 To me: “Methods/Tools are something you use for research. They are not research.”
- 2019 To Geoff: “You will become known merely as a tool builder rather than a serious scholar. A serious scholar cannot waste time on anything but empirical research and advancing theory.”

MACHINE LEARNING / CONTRIBUTED

The Misguided Rush of the Academic AI Brain Drain

23 Aug 2018 9:00am, by Tracy Malingo



Tyler Nosenzo
@tnose14

Follow

Apple Maps: Our artisanal cartographers hope you enjoy this pleasant journey. 28 min

3:05 PM - 24 Jan 2018

Tyler Nosenzo
@tnose14

Follow

Apple Maps: Our artisanal cartographers hope you enjoy this pleasant journey. 28 min

Google Maps: Our algorithm has determined an optimal path for the most efficient route given current traffic conditions. 25 min

3:05 PM - 24 Jan 2018

Tyler Nosenzo
@tnose14

Follow

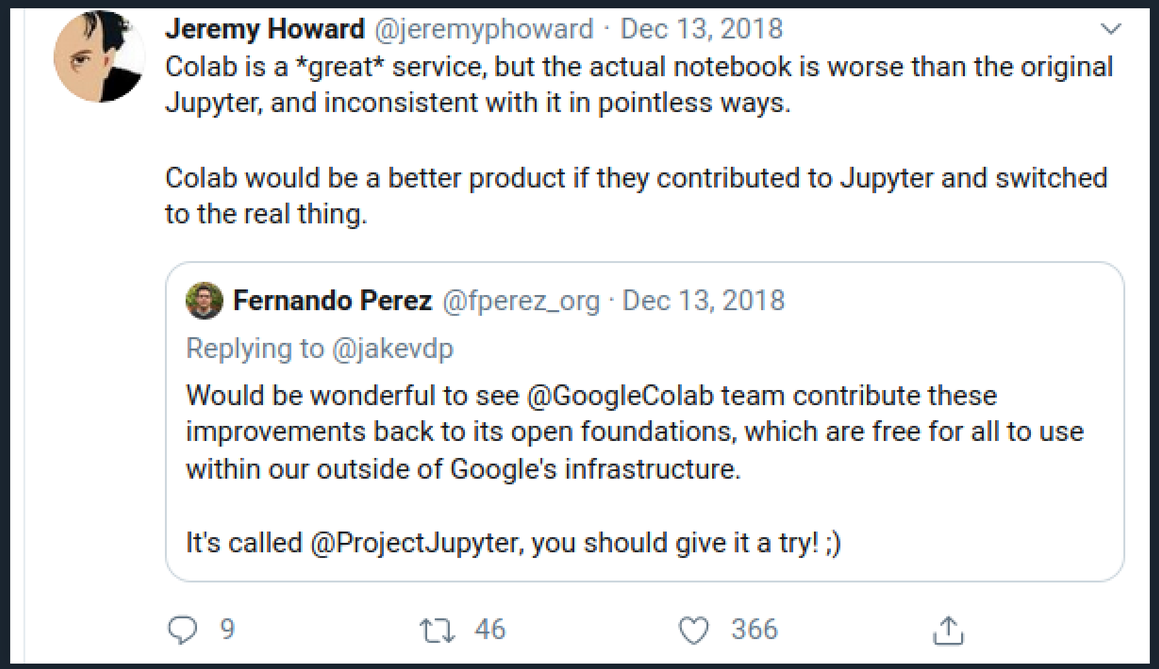
Apple Maps: Our artisanal cartographers hope you enjoy this pleasant journey. 28 min

Google Maps: Our algorithm has determined an optimal path for the most efficient route given current traffic conditions. 25 min

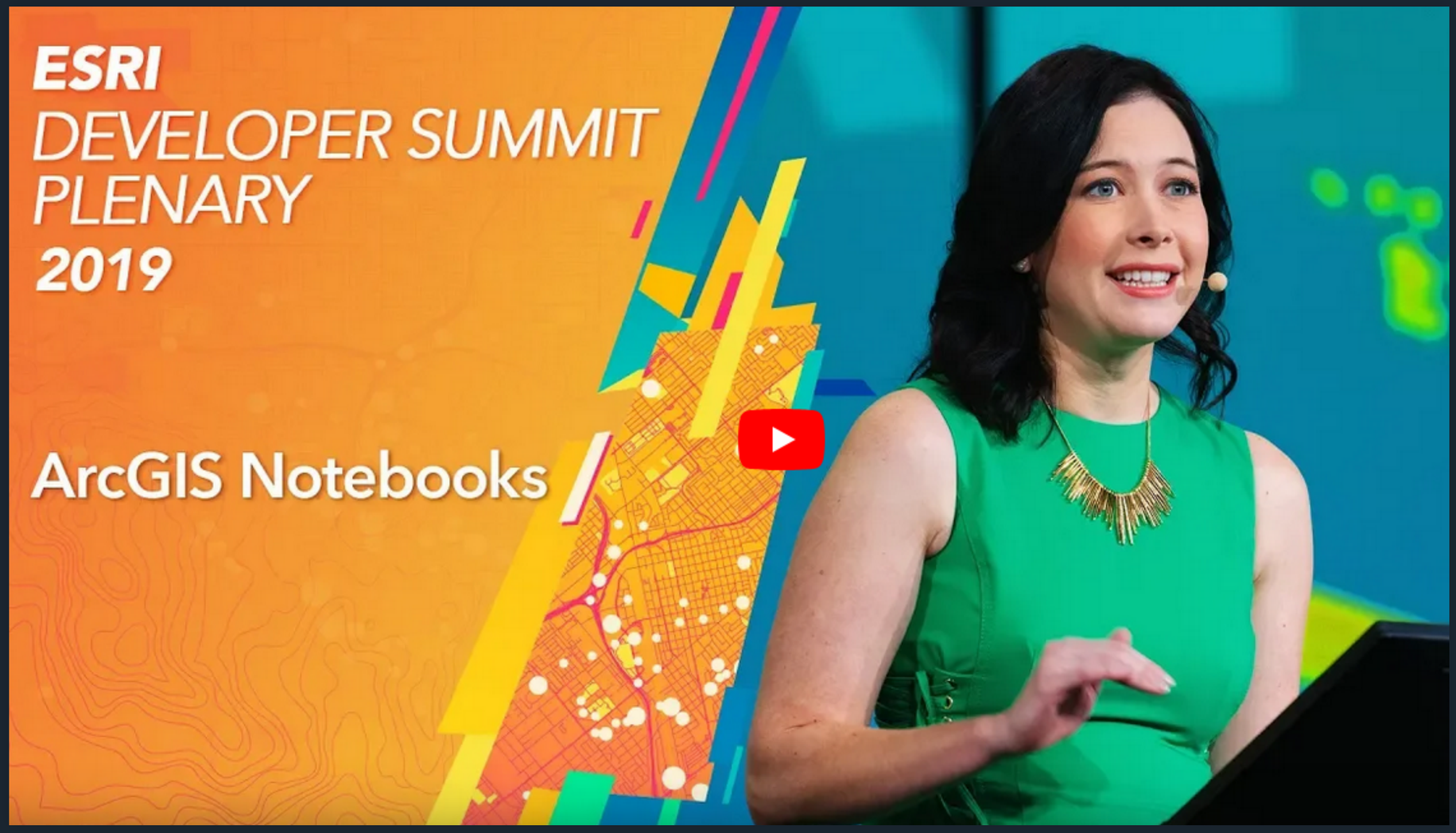
Waze: Drive through this dude's living room. 17 min

3:05 PM - 24 Jan 2018

Cultural Appropriation



Cultural Appropriation



Opportunities

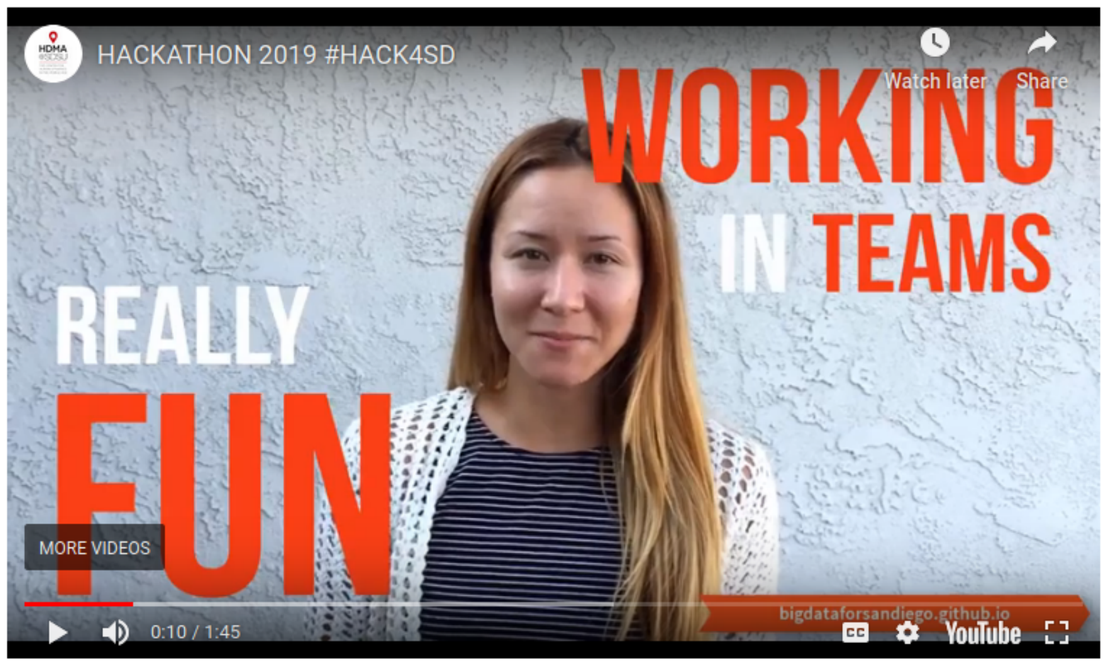
Community Growth

Community Growth

MARCH. 09 & 16

BIG DATA HACKATHON\ SAN DIEGO

\\\\\\\\\ 2019 \\\\\\\\\



Hacking Big Data and Open Data in San Diego #Hack4SD

Dates: March 09 & 16

Location: Peterson Gym (Rm 153)
San Diego State University

Cost: FREE

Contact: Prof. Amy Schmitz Weiss
Prof. Ming-Hsiang Tsou
Prof. Atsushi Nara

Github: Github

Open Publication

UC faculty to Elsevier: Restart negotiations, or else

By Robert Sanders, Media relations | AUGUST 7, 2019

The University of California walked away from negotiations with publishing giant Elsevier over a new contract in February, leaving UC researchers without easy access to some of the world's top research papers. (UC Berkeley illustration by Hulda Nelson)

Journal of Spatial Information Science

The **Journal of Spatial Information Science** (JOSIS) is an international, interdisciplinary, open-access journal dedicated to publishing high-quality, original research articles in spatial information science. The journal aims to publish research spanning the theoretical foundations of spatial and geographical information science, through computation with geospatial information, to technologies for geographical information use. [More about JOSIS...]

JOSIS is run as a service to the geographic information science community, supported entirely through the efforts of volunteers. JOSIS does not aim to profit from the articles published in the journal, which are open access. We encourage you to become involved in JOSIS by registering as a reader, reviewer, or author, or simply making a donation to JOSIS.

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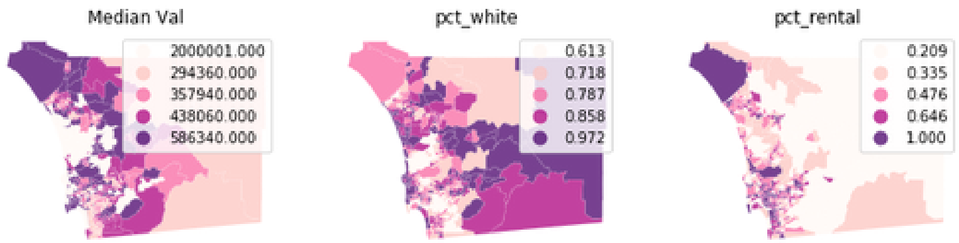
Recently Published Papers 20

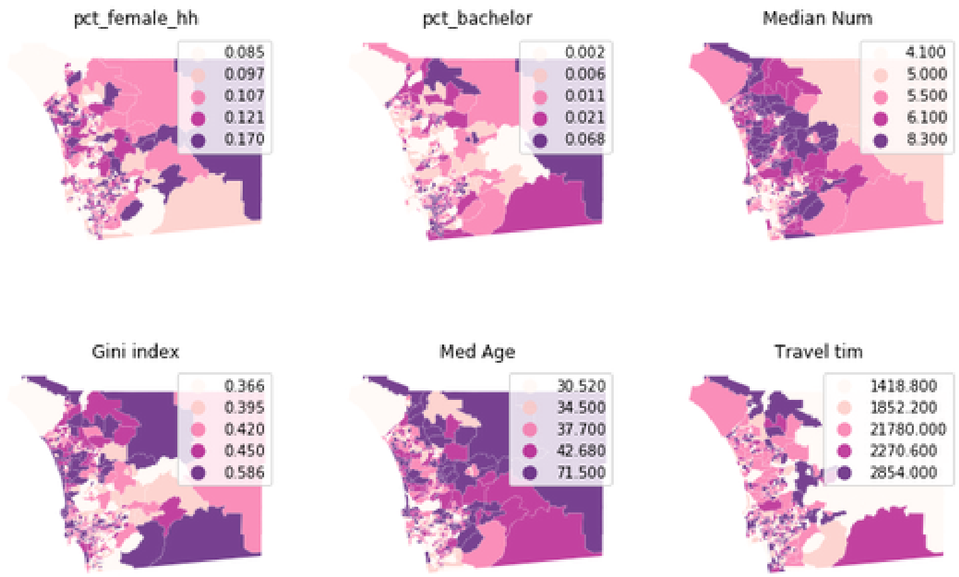
PUBLISHED Published 3 months ago

DraggleSimulator: An Open Source Web Application for Teaching Genetic Drift

JavaScript TypeScript


```
for i, col in enumerate(cluster_variables):
    # select the axis where the map will go
    ax = axs[i]
    # Plot the map
    #db.plot(column=col, ax=ax, scheme='Quantiles',
    #        linewidth=0, cmap='RdPu')
    choropleth(db, col, cmap='RdPu', ax=ax)
    # Remove axis clutter
    ax.set_axis_off()
    # Set the axis title to the name of variable being plotted
    ax.set_title(col)
# Display the figure
plt.show()
```





Many visual patterns jump out from the maps, revealing both commonalities as well as differences across the spatial distributions of the individual variables. Several variables tend to increase in value from the east to the west (`pct_rental` , `Median Val` , `Median Num` , and `Travel tim`) while others have a spatial trend in the opposite direction (`pct_white` , `pct_female_hh` , `pct_bachelor` , `Med Age`). This is actually desirable; when variables have different spatial distributions, each variable to contributes distinct information to the profiles of each cluster. However, if all variables display very similar spatial patterns, the amount of useful information across the maps is actually smaller than it

Open GIScience: Innovation Catalyst

Castells (2018):

> *Innovation happens in the cracks*

“Code as Text” TM 2019

- Open source code as interdisciplinary science glue
- Replication and reproducibility
- Cumulative knowledge building
- New form of science

Universities

"I see this as the essence of open source projects: The energy and creativity of many people with diverse goals together can work miracles!"

– Guido van Rossum

"Every university should host an open source project. It should be a process that lasts decades, spans generations. The goal is two-fold: Add to our technology, and to develop better developers."

– Dave Winer