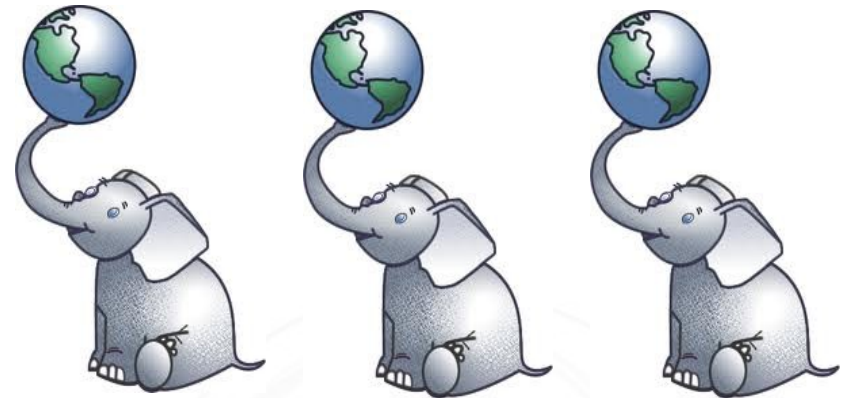
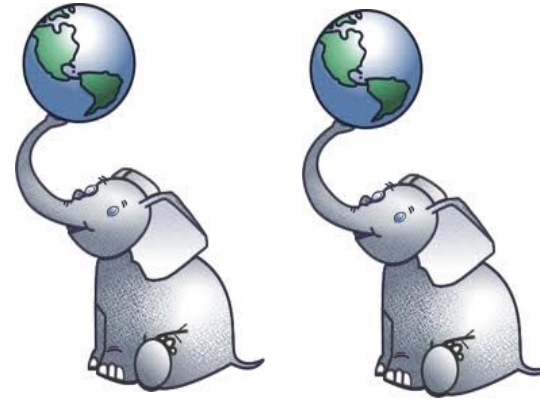


PostGIS de 2 à 3



SIG, principes



Post - G eographical I nformation S ystem

**Capturer, créer, stocker,
analyser, partager,
visualiser la donnée
relative à l'espace**



PostGIS



PostGIS : SGBD Spatial

- > **extension de PostgreSQL**
- > **Types de données géospatiaux**
- > **Systemes de coordonnées**
- > **Toutes les opérations SIG**
- > **OpenSource (GPLv2)**



Pourquoi c'est génial

- > **extension de PostgreSQL**
- > **Rapide et robuste (plus que A----S)**
- > **La puissance du SQL spatial**
- > **Supporté par toute l'industrie géospatiale**



PostGIS 2.0

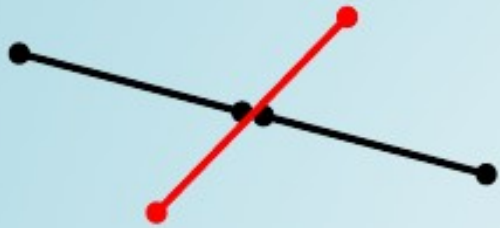
3 avril 2012



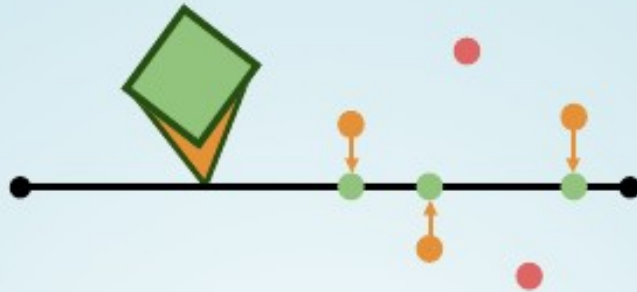
PostGIS 2.0

- > **Nouvelle sérialisation**
- > **Typemod pour les types spatiaux**
- > **Intégration des rasters**
- > **Début du support 3D**
- > **Indexation N-dim**
- > **Recherche KNN indexée**
- > **Topologie**





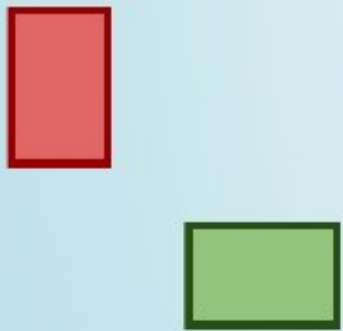
ST_Split



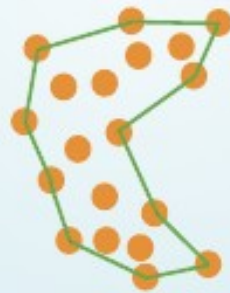
ST_Snap



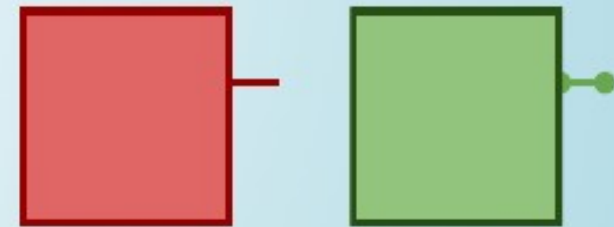
ST_OffsetCurve



ST_FlipCoordinates



ST_ConcavHull



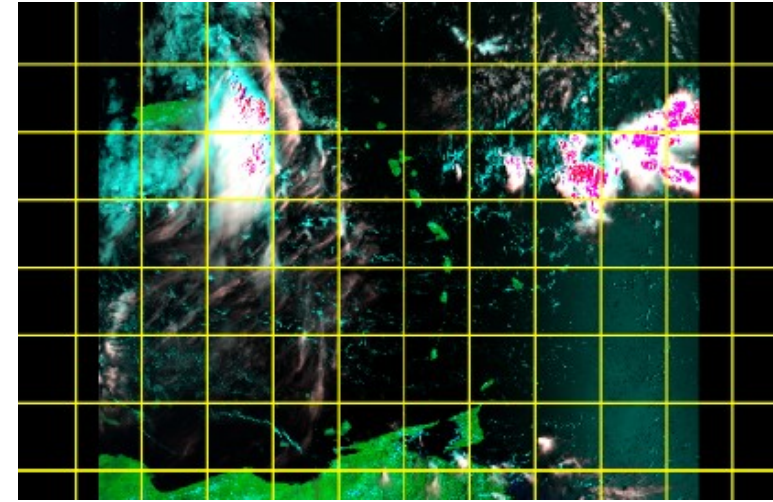
ST_MakeValid

PostGIS 2.1

17 août 2013



PostGIS 2.1 : rasters !



- > **réécriture de fonctions en C**

- > **fonctions de jointure**

 - (**ST_contains, ST_DWithin...**)

- > **Découpage avec ST_Tile**

- > **Support multi-bande pour ST_Union**

- > **Fonctions d'analyse de terrain (roughness)**

- > **...**



ST_DelaunayTriangles



SFCGAL

New backend based on
wrapper lib to **CGAL**

ST_Extrude

ST_3DArea

ST_3DIntersection

ST_Tessellate

ST_Orientation

etc.

PostGIS 2.2

7 Octobre 2015





ST_Subdivide

(ST_Segmentize for lines)

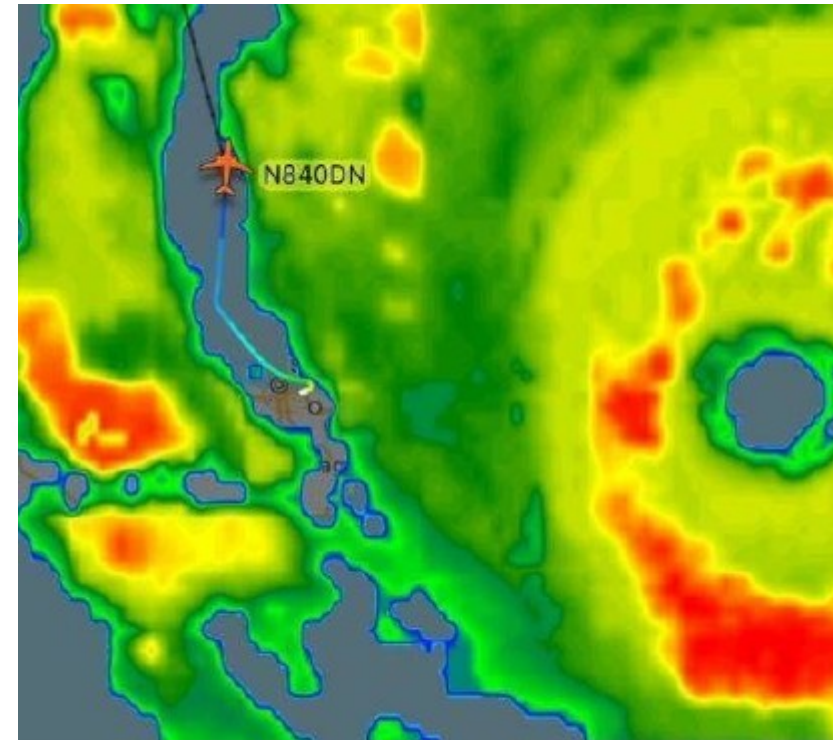


ST_Subdivide

(ST_Segmentize for lines)

Fonctions temporelles

- > **ST_ClosestPointOfApproach**
- > **ST_DistancePCA (ou $||$)**
- > **ST_CPAWithin**
- > **ST_IsValidTrajectory**



SFCGAL

> **ST_Volume,**

g > **ST_makeSolid, ST_IsSolid**

> **ST_3DUnion & ST_3DDifference**

> **ST_ApproximateMedialAxis**

g > **CREATE EXTENSION postgis_sfcgal ;**



3D city model of Vienna



Compress Geometry with

ST_AsTWKB

```
SELECT
  pg_size_pretty(sum(ST_MemSize(geom))) AS original,
  pg_size_pretty(sum(length(ST_AsTWKB(geom)))) AS twkb
FROM
  vorarlberg.wald;
```

original	twkb
17 MB	2333 kB

More: <https://carto.com/blog/smaller-faster/>

Et aussi

- > **KNN pour geography**
- > **KNN exact avec recheck (PG 9.5)**
- > **Nouvel algorithme de simplification
(ST_SimplifyVW)**
- > **ST_RemoveRepeatedPoints avec tolérance**
- > **ST_SwapOrdinates**
- > **PostGIS Topology API en C**



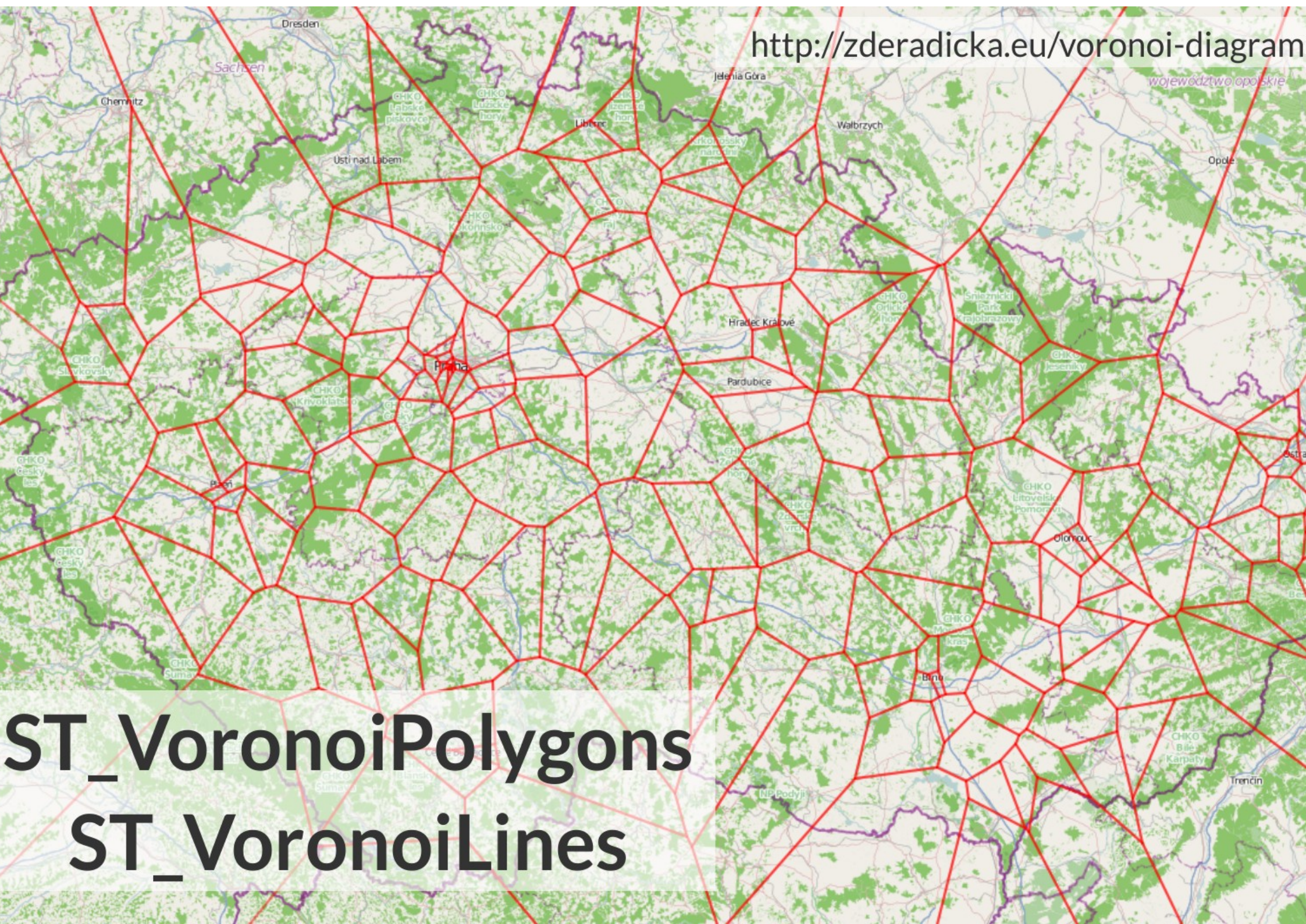
PostGIS 2.3

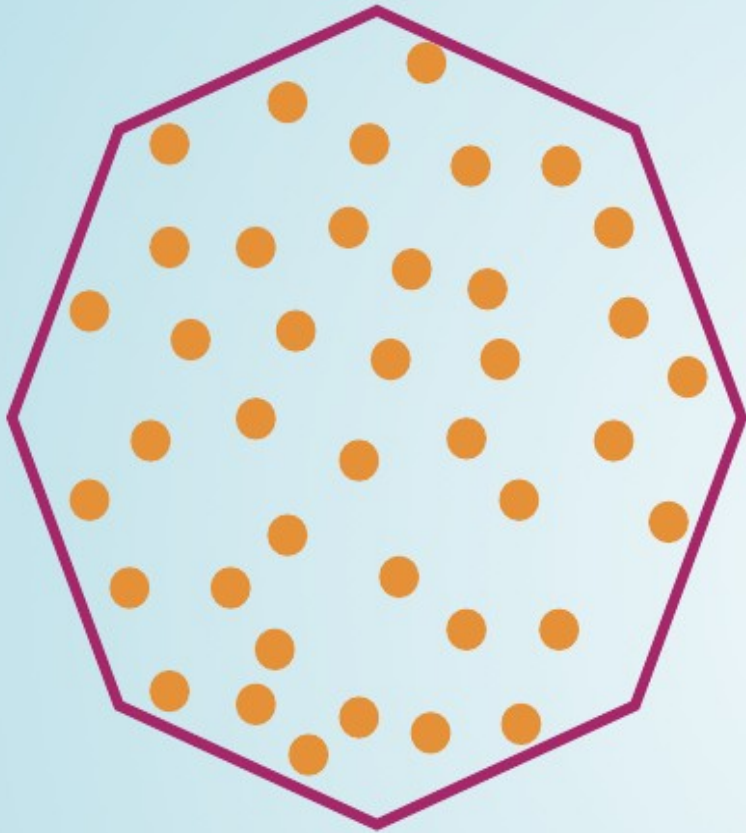
26 Septembre 2016



<http://zderadicka.eu/voronoi-diagram>

ST_VoronoiPolygons
ST_VoronoiLines

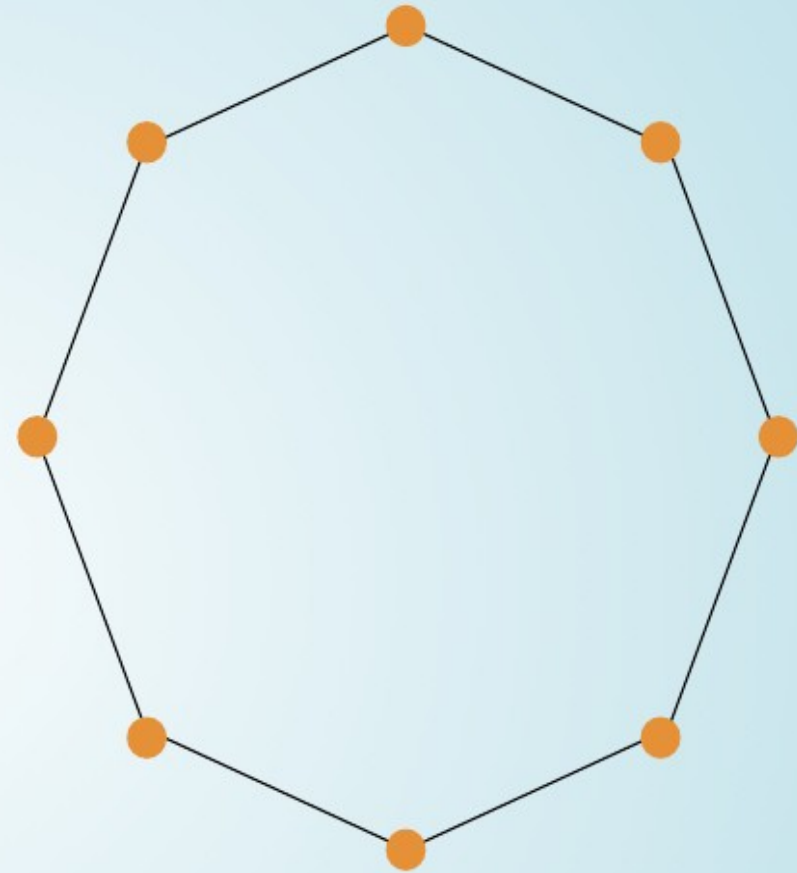




ST_GeneratePoints

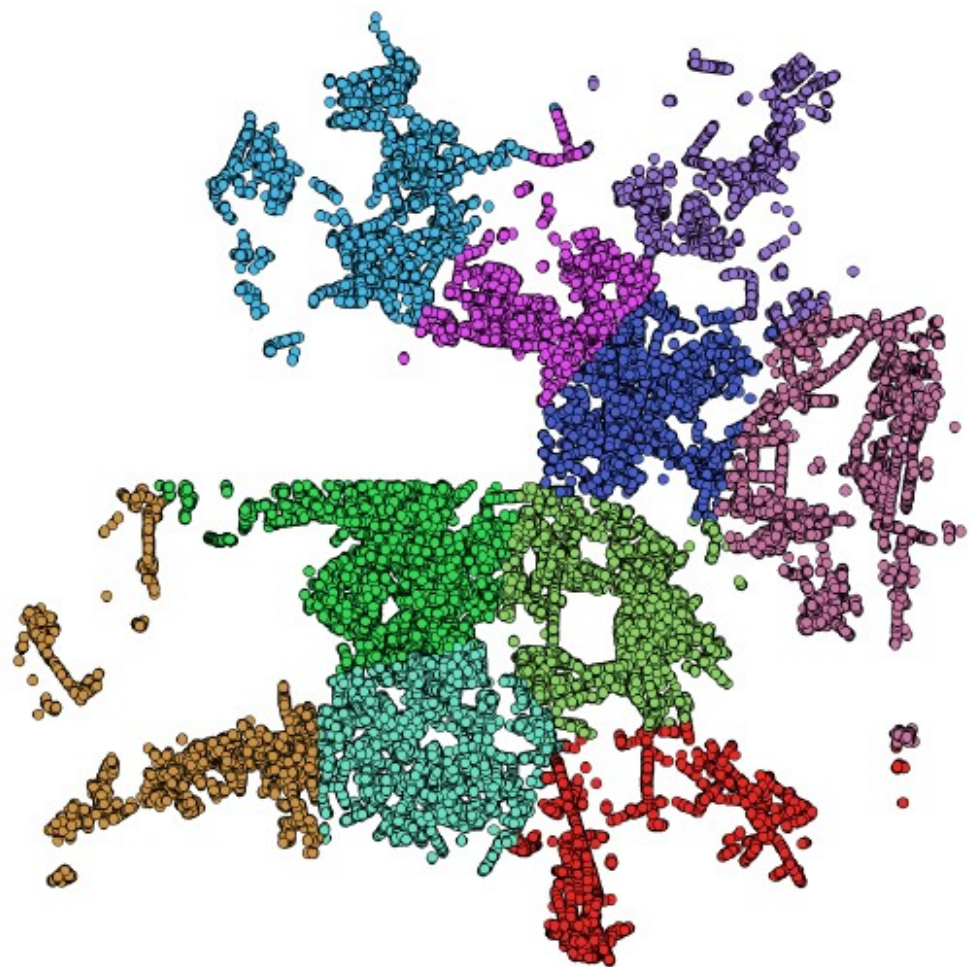
Performance: <http://www.danbaston.com/posts/2016/12/17/generating-test-data-in-postgis.html>

Polygon splitting: <http://blog.cleverelephant.ca/2018/06/polygon-splitting.html>

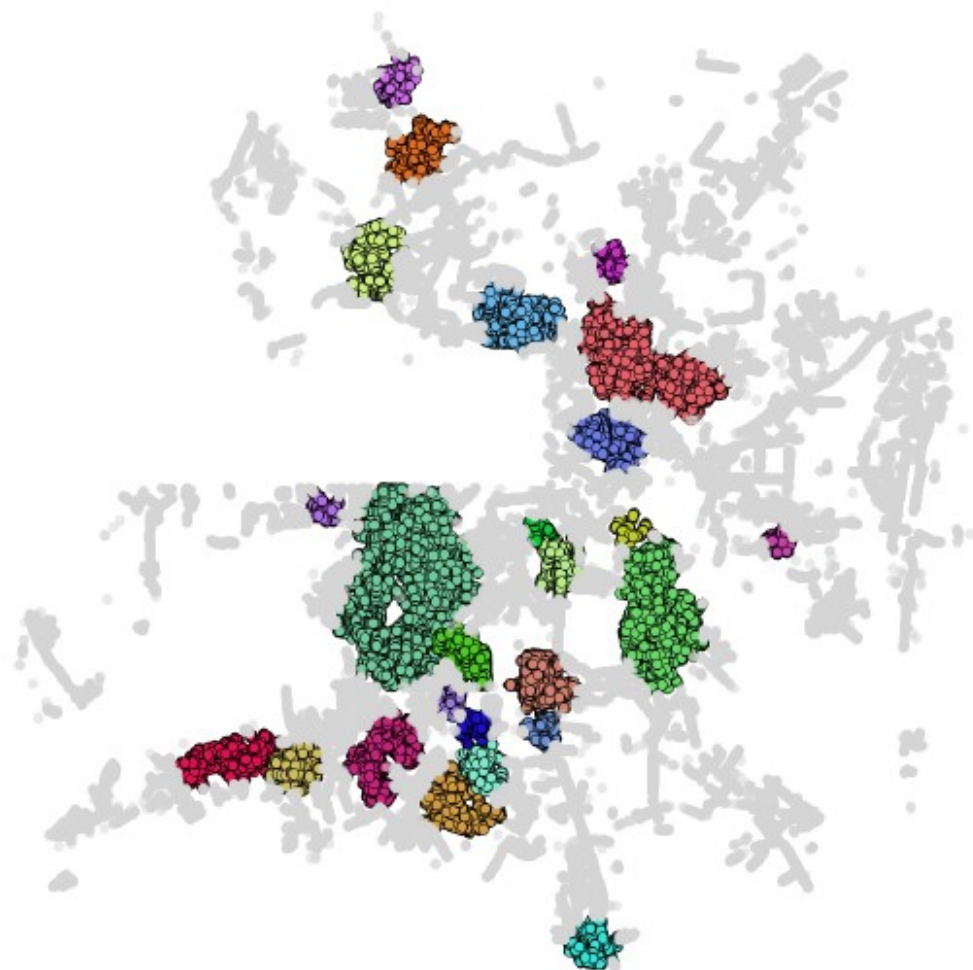


ST_Points

(returns MultiPoint)

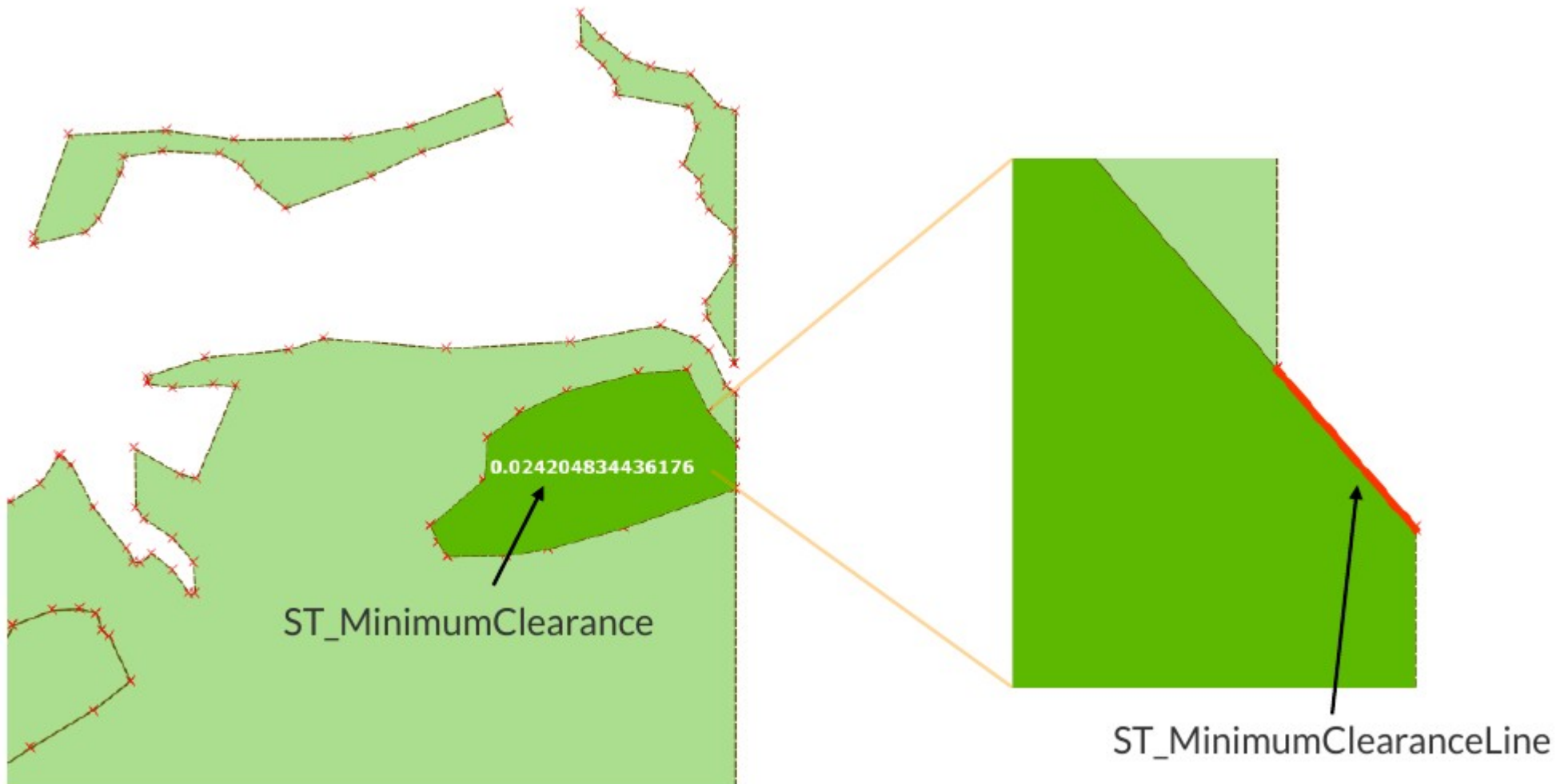


ST_ClusterKMeans



ST_ClusterDBSCAN

> **ST_MinimumClearance :**
valeur de proximité de l'invalidité



PostGIS 2.4

30 Septembre 2017





Vector Tiles Export

<https://www.mapbox.com/vector-tiles/>

ST_AsMVTGeom (for geometry)

ST_AsMVT (MVTGeom + attributes)

@_phiphou__ (https://twitter.com/_phiphou_/status/878599027473952769)

<https://carto.com/blog/inside/MVT-mapnik-vs-postgis/>

ST FrechetDistance

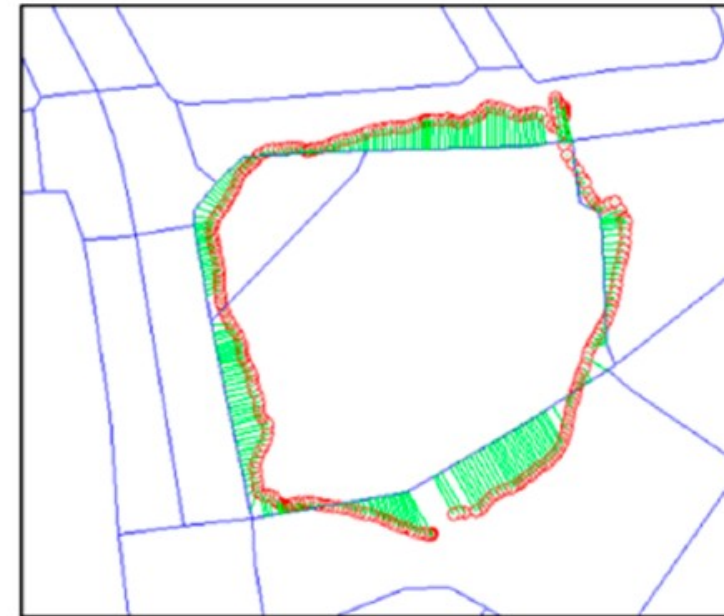
Proximité de deux
lignes



Route 2



Route 3



Route 4

PostGIS 2.5

23 Septembre 2018



SP-Gist pour les géométries

- > **Indexation spatiale**
- > **Pour les points et les bounding boxes**
- > **Plus rapide pour les « spaghetti »**
- > **2D et 3D**
- > **Pas de support KNN**
- > **Uniquement pour PG v11**

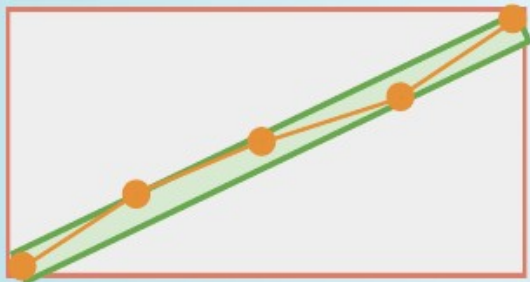




ST_Buffer with 'side={left | both | right}'



ST_FilterByM



ST_OrientedEnvelope
(ST_MinimumRectangle)



ST_ChaikinSmoothing
(Iterate to create Bezier curves)

PostGIS 3.0

2019.. 2020..



PostGIS 3.0

- > **Faciliter les mises à jour**
- > **Nouvelle sérialisation ?**
- > **Raster dans le cœur ou dehors ?**
- > **Tolérance et précision ?**
- > **Geography en 3D ?**
- > **CAST JSON/JSONB ?**
- > **Nettoyage du code C ?**
- > **Index-only scans avec la géométrie ?**

<https://trac.osgeo.org/postgis/wiki/PostGIS3>



Google Summer of Code 2018

pgAdmin4 plugin for viewing data

Mentors: [Victoria Rautenbach](#) and [Frikan Erwee](#)

[pgAdmin](#) graphical user interface (GUI) administration tool for [PostgreSQL](#) that allows you to execute spatial queries using [PostGIS](#) on geospatial data. Currently, there is no integrated geospatial data viewer in pgAdmin and external applications, such as [QGIS](#), are required. For this project, you will develop a GUI that allows users to view the tables in a spatial database and the results of queries executed as geometries. Also, refer to [this page](#) for more detail on the project.

Languages and APIs: Python, JavaScript? and JavaScript? APIs such as, require.js, bootstrap and OL3.

Test for potential students:

Task 1: Write a Python program to construct an array by repeating the values within the original array three times.

Expected Output:

Original array [1, 2, 3, 4]

Repeating 2 times [1 2 3 4 1 2 3 4]

Repeating 3 times [1 2 3 4 1 2 3 4 1 2 3 4]

Task 2: Create a basic web map using [OpenLayers?](#) displaying JSON layer, also ensure that you bootstrap the page. You can use any open data JSON layer, for example, datasets from the World Bank Open Data Portal.

Financez !

- > **Partitionnement spatial**
- > **Précision pour les overlays**
- > **Fonctions raster**
- > **postgis_topology**
- > **Maintenance SFCGAL**
- > **...**

<https://trac.osgeo.org/postgis/milestone/PostGIS%20Fund%20Me>



Merci !

Felix Kunde

Thanks to

Regina, Paul, Sandro, Mark, Bborie,
Jorge, Nicklas, Dan, Olivier, Björn, Mateusz, Pierre, Darafei
Chris, Kevin, Dave, Jeff, Mark, David

Alex, Alex, Andrea, Andreas, Andreas, Anne, Arthur, Barbara, Ben, Bernhard, Brian, Bruce, Bruno, Bryce, Carl, Charlie, Dane, David, David, Eduin, Even,
Esteban, Frank, George, Gerald, Gino, Guillaume, Iida, Ingvild, Jason, Jeff, Jose Carlos, Julien, Kashif, Klaus, Kris, Leo, Loic, Luca, Maria, Mark, Markus,
Maxime, Maxime, Michael, Mike, Nathan, Nathaniel, Nikita, Norman, Rafal, Ralph, Rémi, Richard, Silvio, Steffen, Stephen, Tom, Vincent, Vincent

Teams behind GEOS, GDAL and Proj!

The whole PostgreSQL community!

The funding companies, organisations and individuals!

