Open mobility

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WWCS 2020 tutorial

Tutorial

Part I: statistics from mobility data, application on open taxi data

Part II: data visualisation with kepler.gl, python etc.

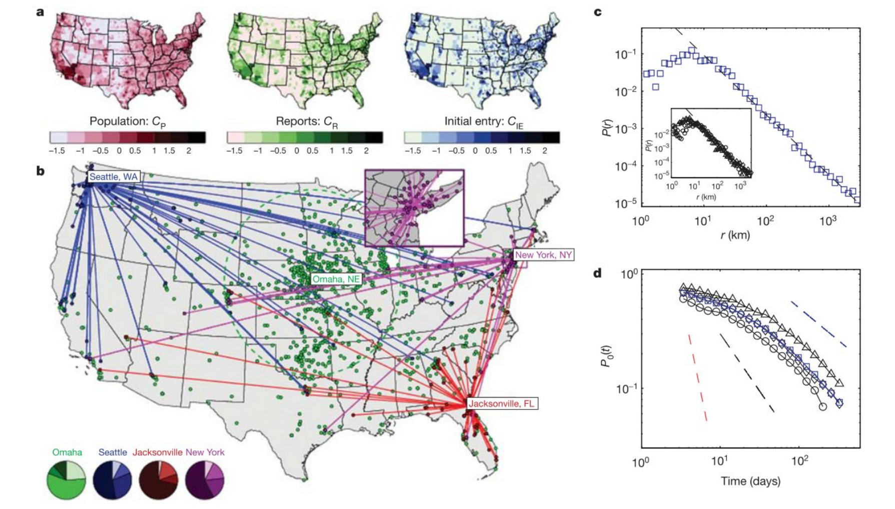
Transportational structures you see from the airplane

Measures and methods

Spatial and temporal analysis:

How distributions of trips length durations look like?

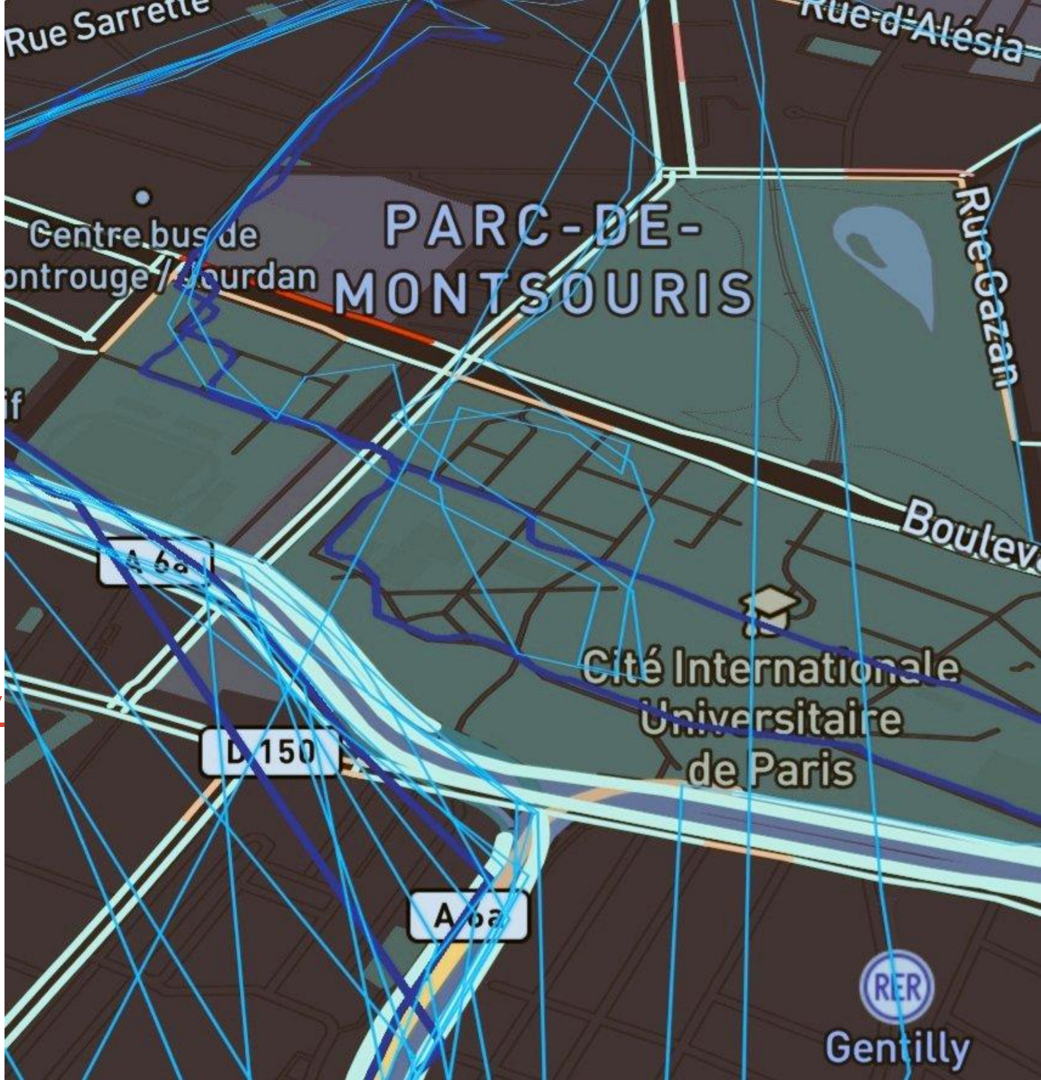
Packages:
Matplotlib, cartopy - simple plotting, **Folium** - online plotting, **geopandas, libpysal** - spatial distribution, **Osmnx** - analysis of openstreetmaps



Notebooks

Github link https://github.com/Liyubov/visualisation_transport_flow

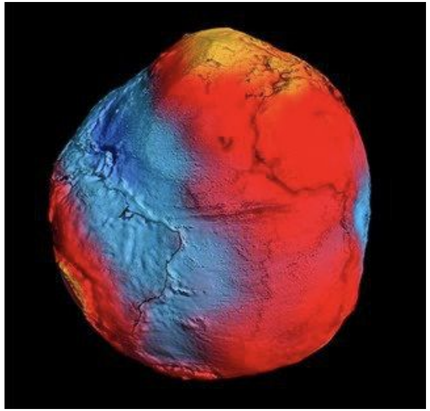
Figure from Move in Saclay app



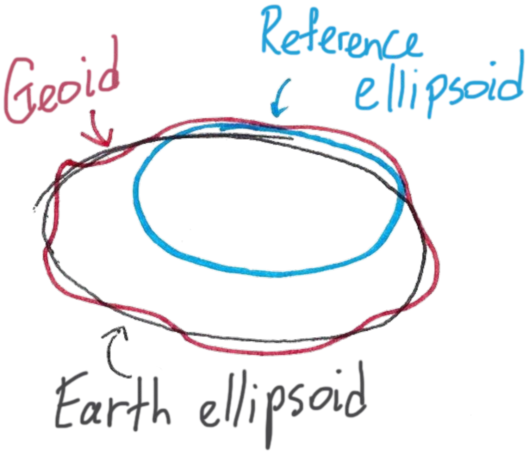
Visualisation

Earth is not (exactly) round!

Expectation



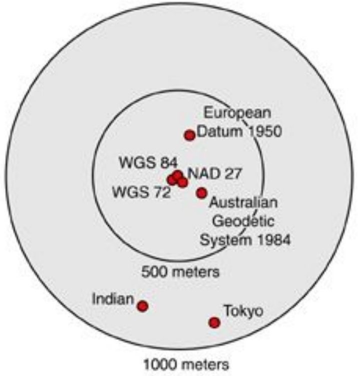
Reality



Different coordinates systems:

WGS 84, NAD83, ED50, GRS80…

(used in GPS)



Practical aspects

Coordinates representation:

- (7.1757822, 46.6177318) - ex: GPS, Google
  longitude latitude
- 46° 37' 06.9" N, 7° 10' 36.0" E - ex: GoPro
  deg min sec

You are here!
latitude
longitude

Conversion formula:

👎👎 46.6177318 ≠ 46.37069

💪💪 46.6177318 = 46 + 37/60 + 6.9/3600

GeoJson - universal format for geodata

Collection of featured geometrical objects.

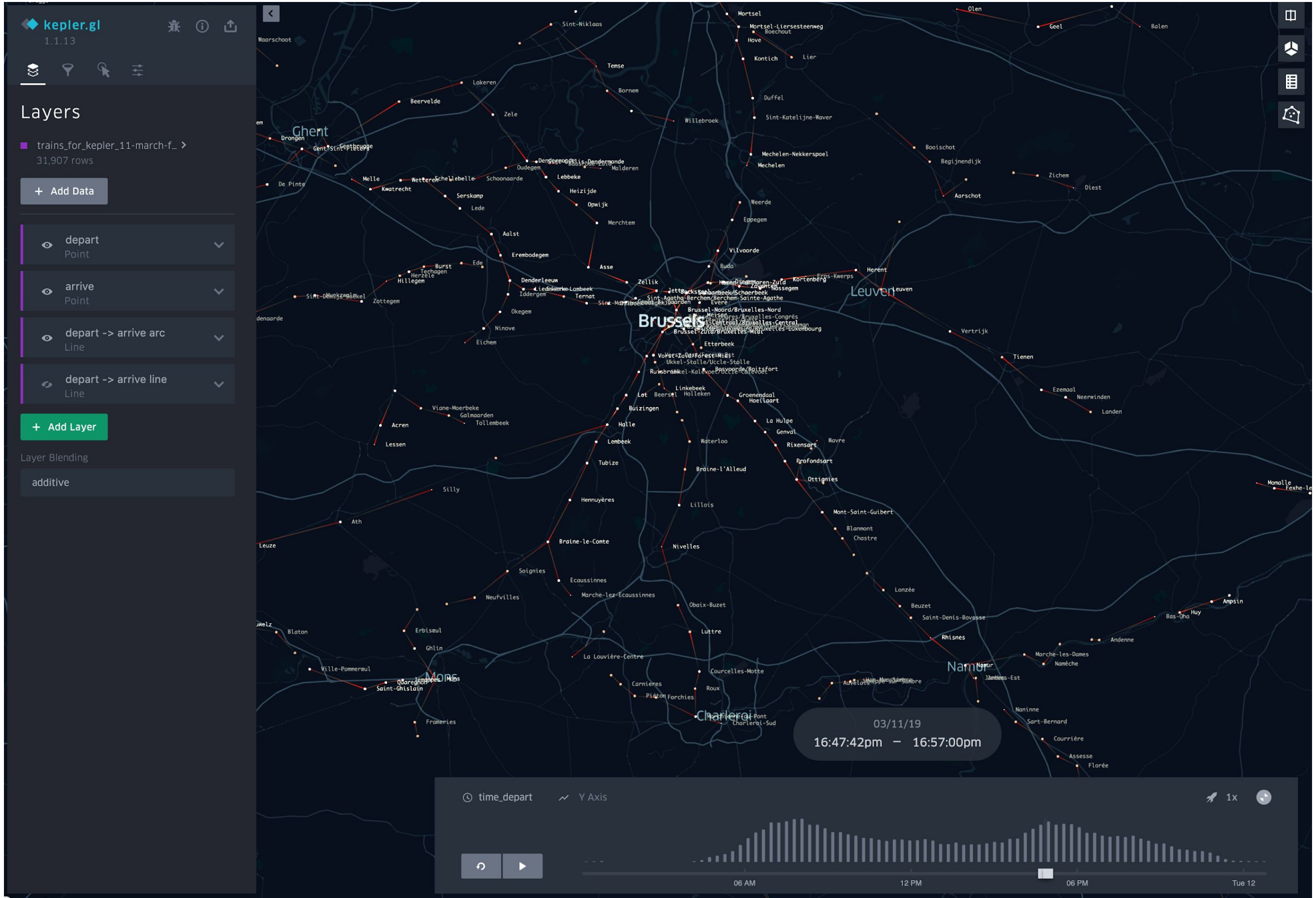
Python: geojson (https://python-geojson.readthedocs.io/)
geopandas (http://geopandas.org/)
shapely (https://shapely.readthedocs.io/) -- libpysal

```
{
     "type": "Feature",
     "geometry": {
          "type": "Point",
          "coordinates": [125.6, 10.1]
     },
     "properties": {
     "name": "You are here!"
     }
}
```

```
Point,
LineString,
Polygon,
MultiPoint,
MultiLineString,
MultiPolygon
```

https://geojson.org/

Kepler.gl - geodata visualisation



kepler.gl
1.1.13

Layers

trains_for_kepler_11-march-f...
31,907 rows

+ Add Data

depart
Point

arrive
Point

depart -> arrive arc
Line

depart -> arrive line
Line

+ Add Layer

Layer Blending
additive

03/11/19
16:47:42pm – 16:57:00pm

time_depart
Y Axis
1x

Some useful links

Links to data repositories with open mobility data

www.openhumans.org

Kepler.gl deck.gl

Hackathons on open data https://liyubov.github.io/healthycityhack.github.io/

https://github.com/Liyubov/open_data

https://github.com/an-medvedev/open-mobility-tutorial