

CrossroadsDescriber

Automatic Textual Description of OpenStreetMap Intersections

Jérémie Kalsron¹, Jean-Marie Favreau¹, Guillaume Touya²

[1] Université Clermont Auvergne, CNRS, Mines de Saint-Étienne, Clermont-Auvergne-INP, LIMOS, F-63000, Clermont-Ferrand, France.

[2] LASTIG, Université Gustave Eiffel, ENSG, IGN, F-94160, Saint Mandé, France.



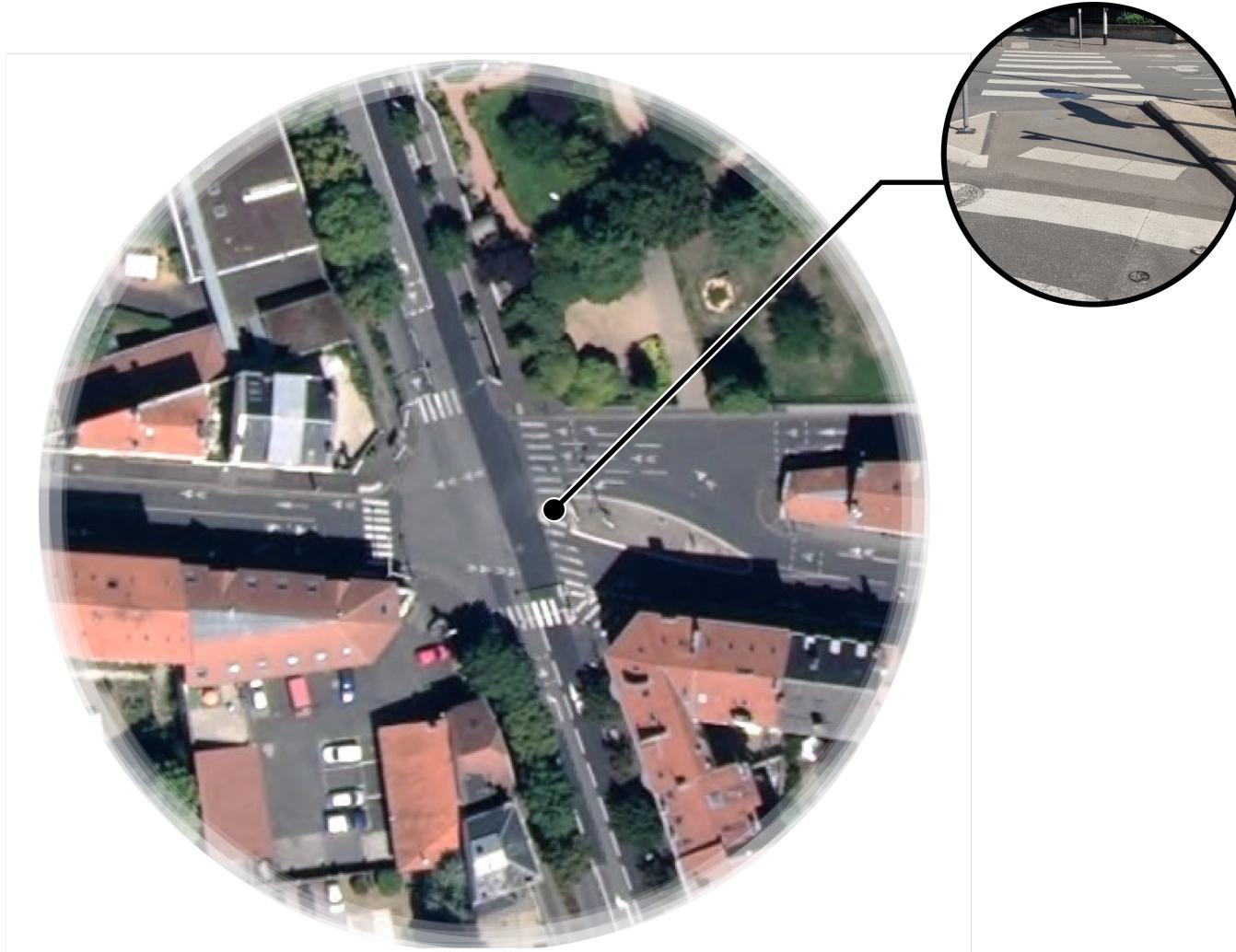
@norslakj





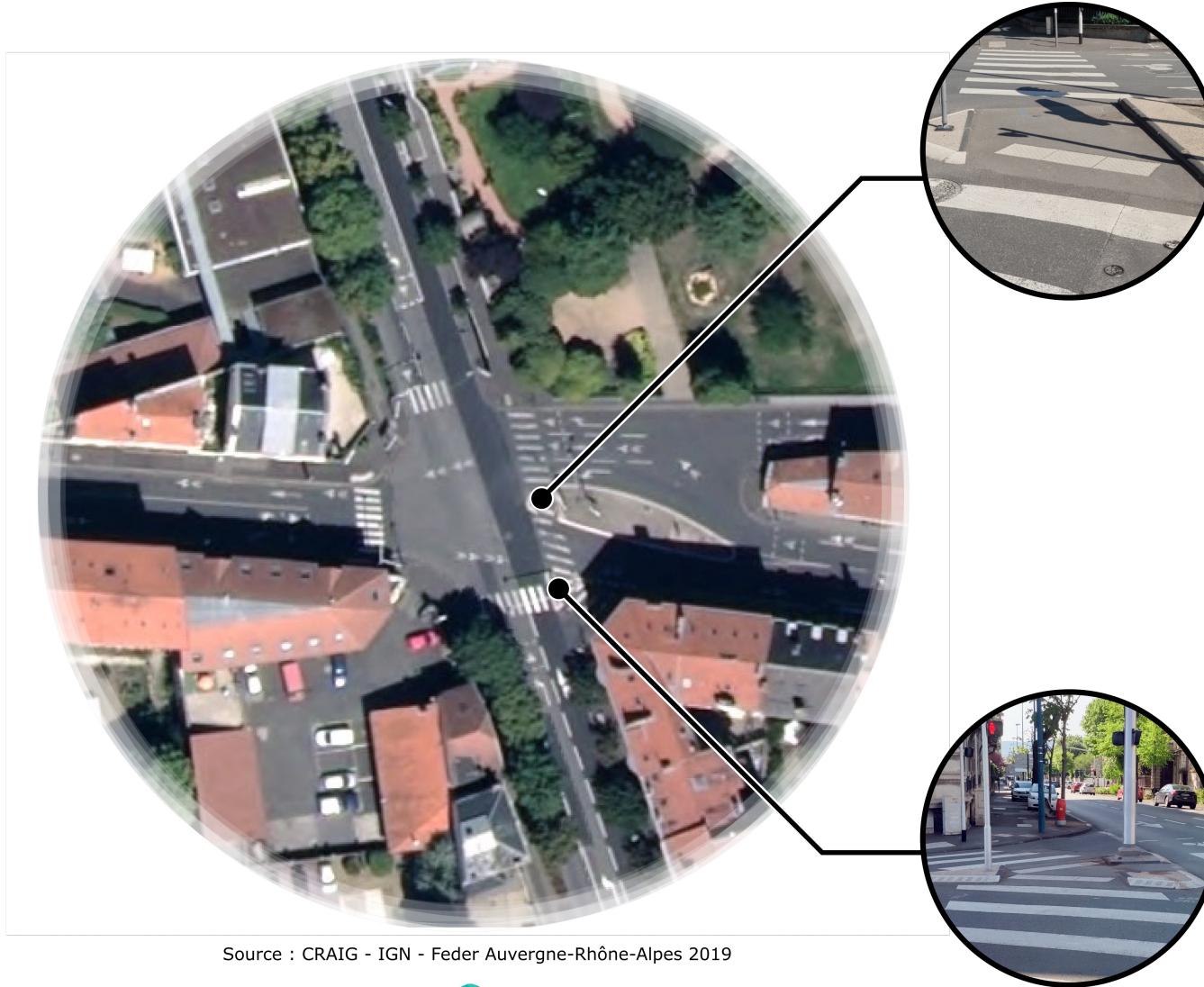
Source : CRAIG - IGN - Feder Auvergne-Rhône-Alpes 2019

Why describing an intersection ?



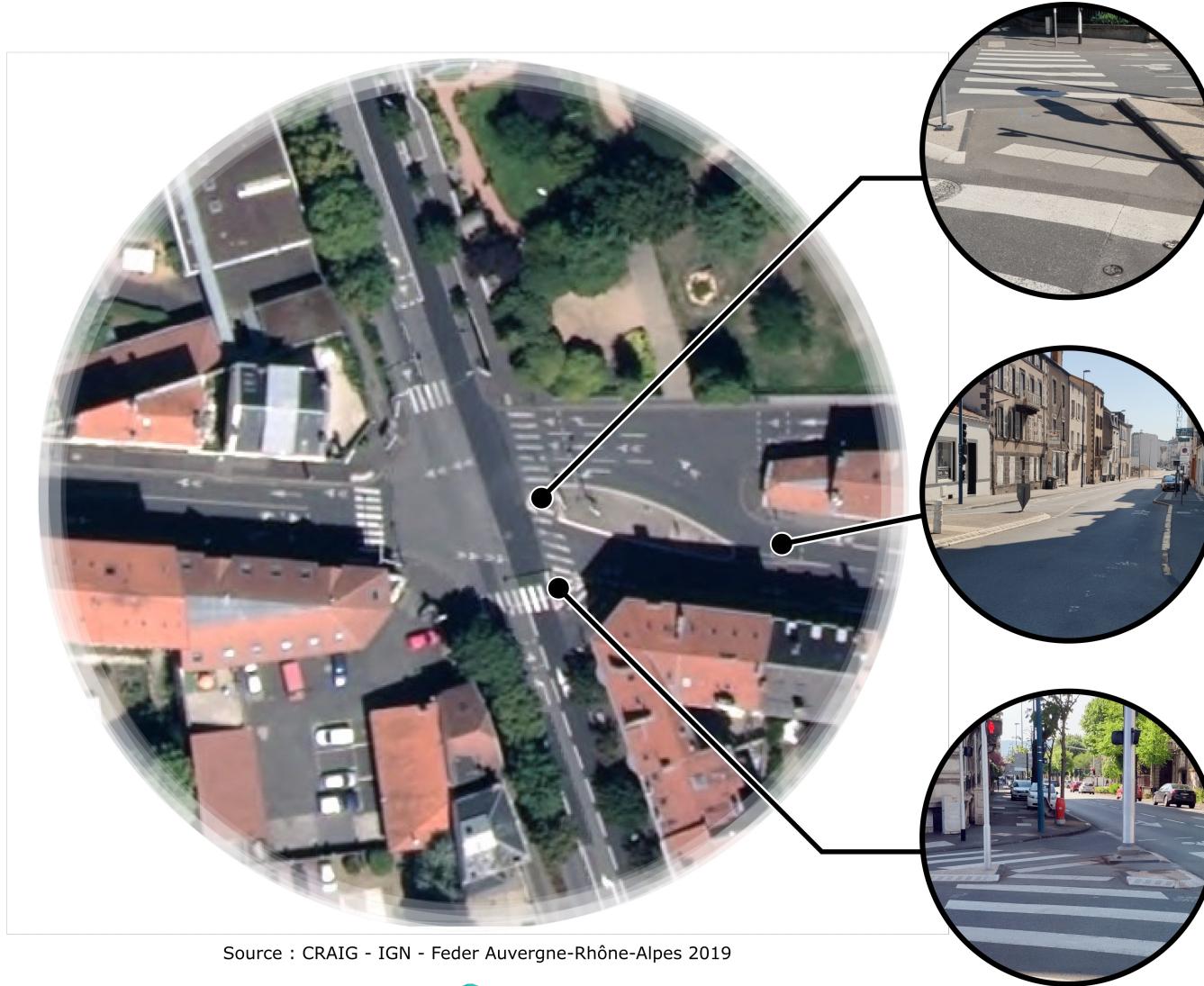
Source : CRAIG - IGN - Feder Auvergne-Rhône-Alpes 2019

Why describing an intersection ?



Source : CRAIG - IGN - Feder Auvergne-Rhône-Alpes 2019

Why describing an intersection ?



Why describing an intersection ?



Source : CRAIG - IGN - Feder Auvergne-Rhône-Alpes 2019

Why describing an intersection ?

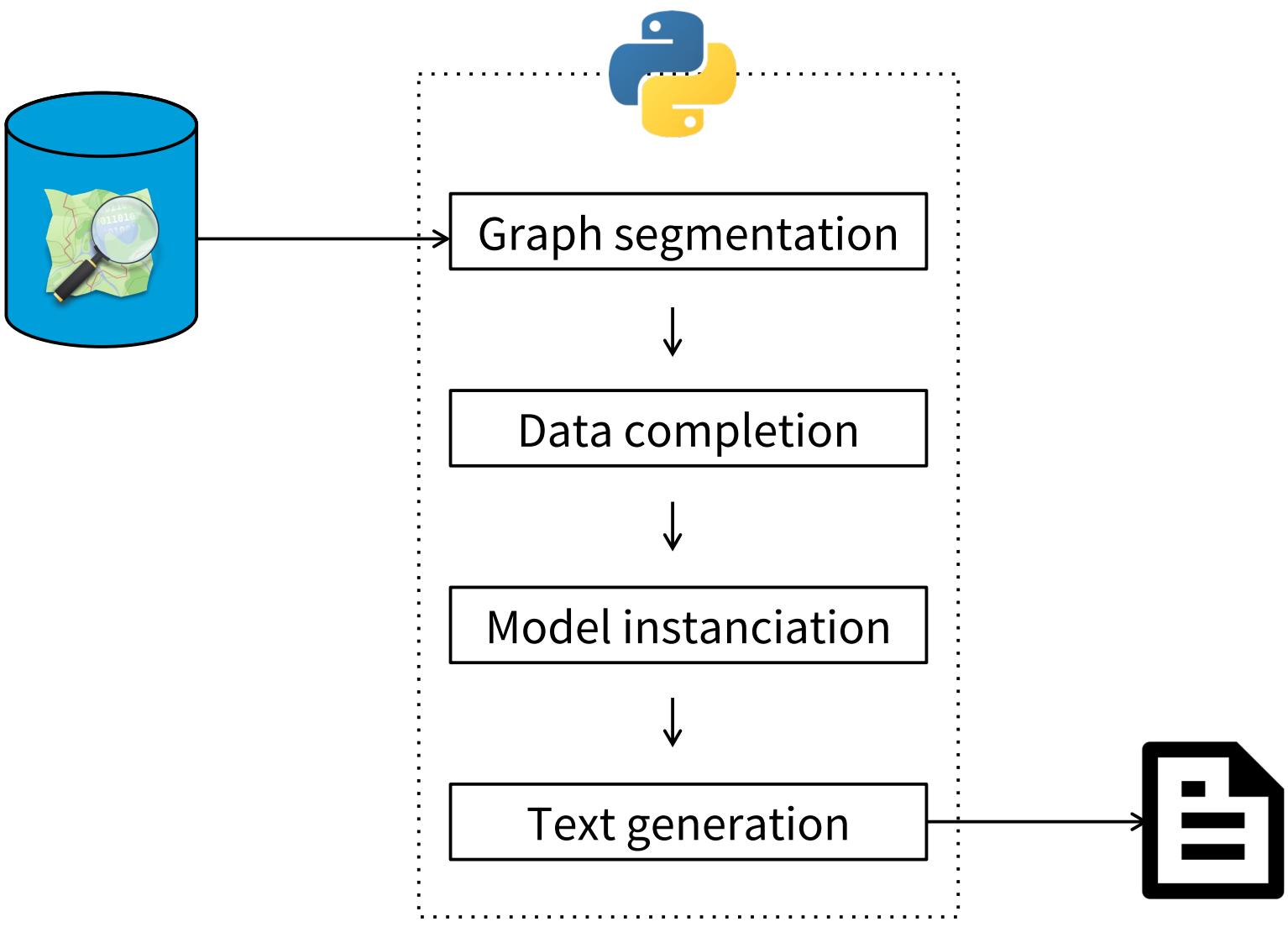


It is a five branches intersection.

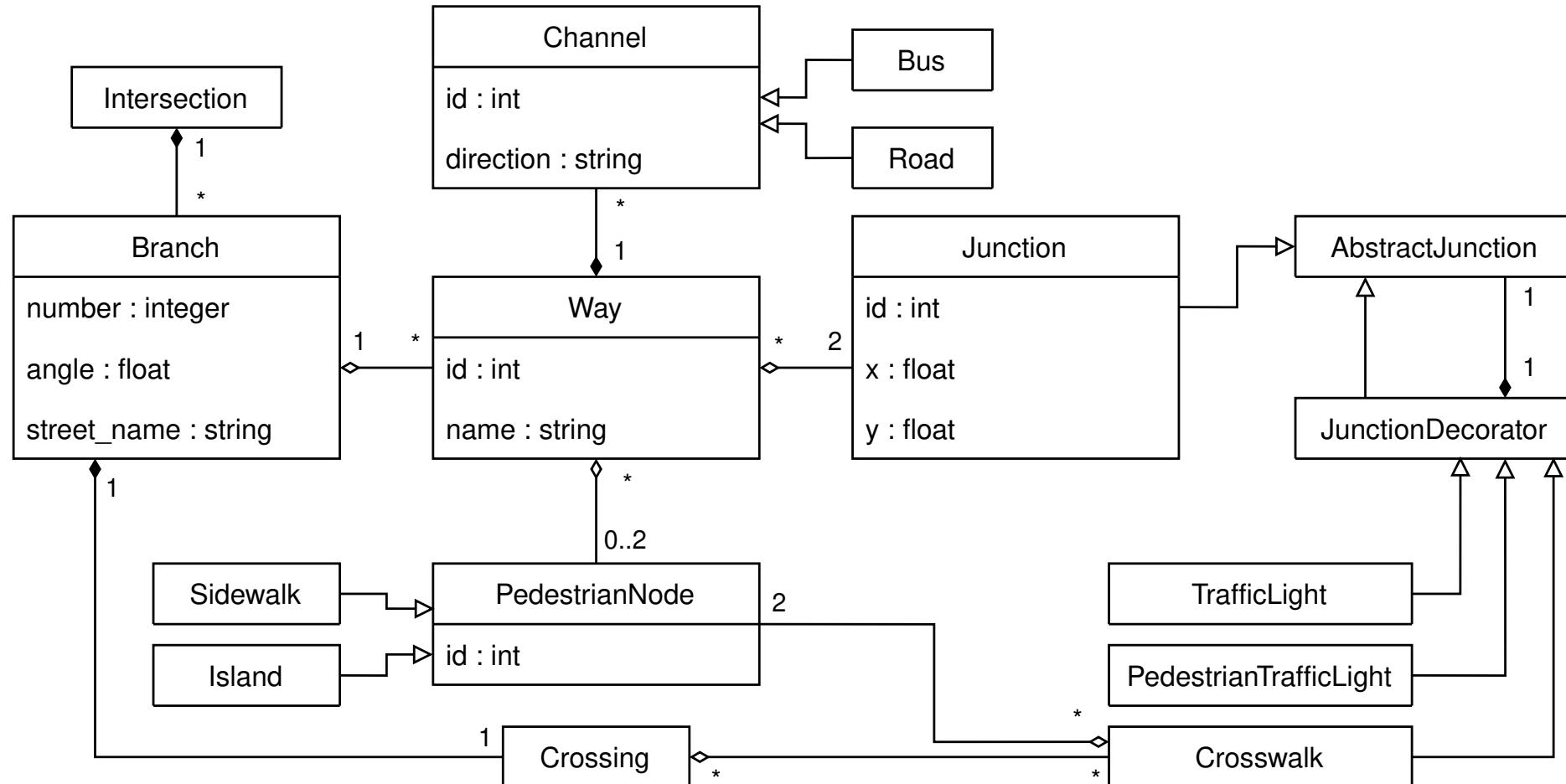
The first branch is composed of two outgoing car lanes and one incoming car lane.
(...)

The fourth branch can be crossed in two times.
(...)

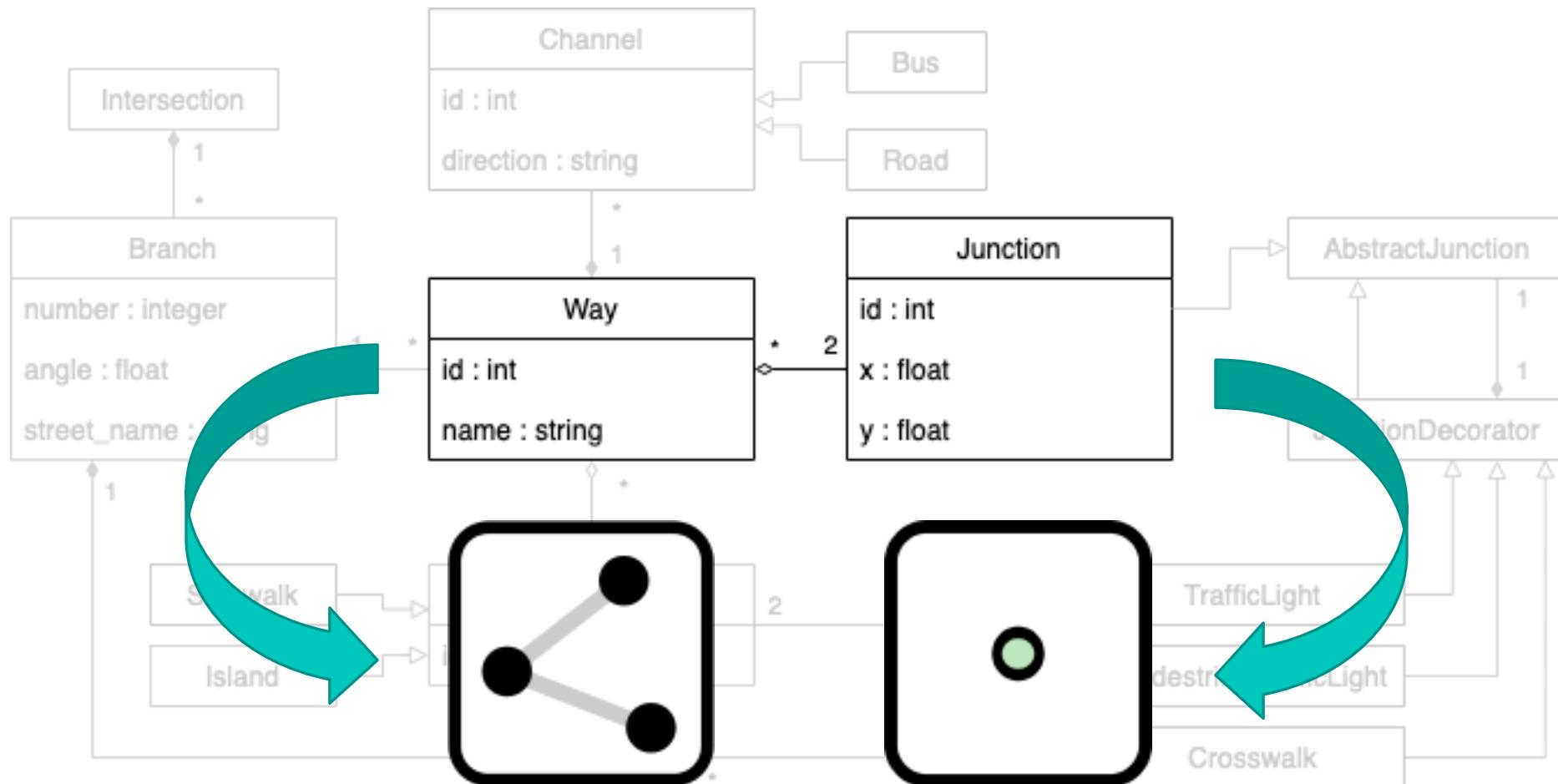
Why describing an intersection ?



Pipeline



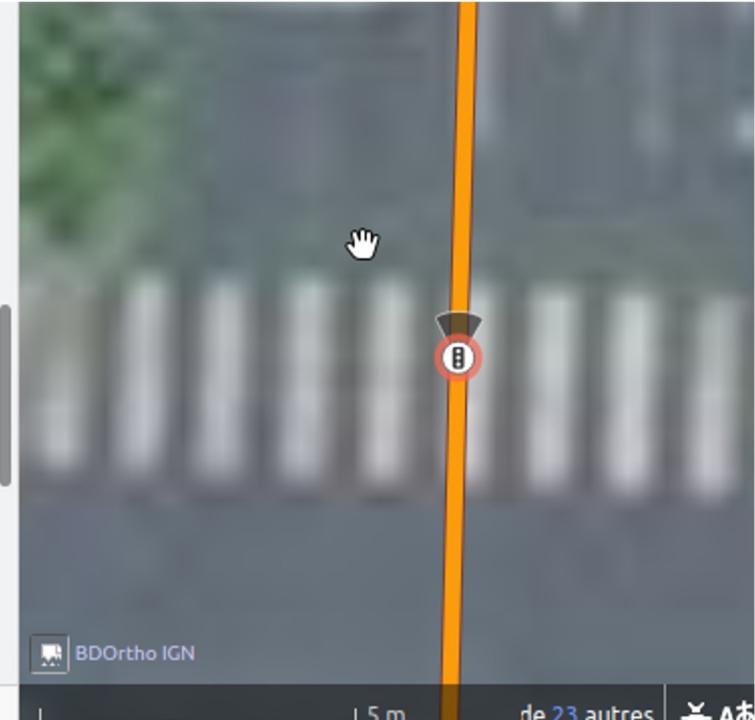
Data model



Data model

button_operated	no		
crossing	traffic_signals		
crossing:island	no		
highway	traffic_signals		
kerb	lowered		
source	Orthophotographie CR ...		
supervised	no		
tactile_paving	yes		
traffic_signals	signal		
traffic_signals:direction	forward		
traffic_signals:sound	no		

[Consulter sur openstreetmap.org](#)



The screenshot shows a street view with a prominent orange line running vertically down the center of the road. A red circle with a white letter 'B' is overlaid on the orange line, indicating a specific location of interest. The map includes a scale bar (5 m), a legend (BDOortho IGN), and a link to 'de 23 autres' (from 23 others) features.

Source : OpenStreetMap contributors

Data model

button_operated	no		
crossing	traffic_signals		
crossing:island	no		
highway	traffic_signals		
kerb	lowered		
source	Orthophotographie CR ...		
supervised	no		
tactile_paving	yes		
traffic_signals	signal		
traffic_signals:direction	forward		
traffic_signals:sound	no		

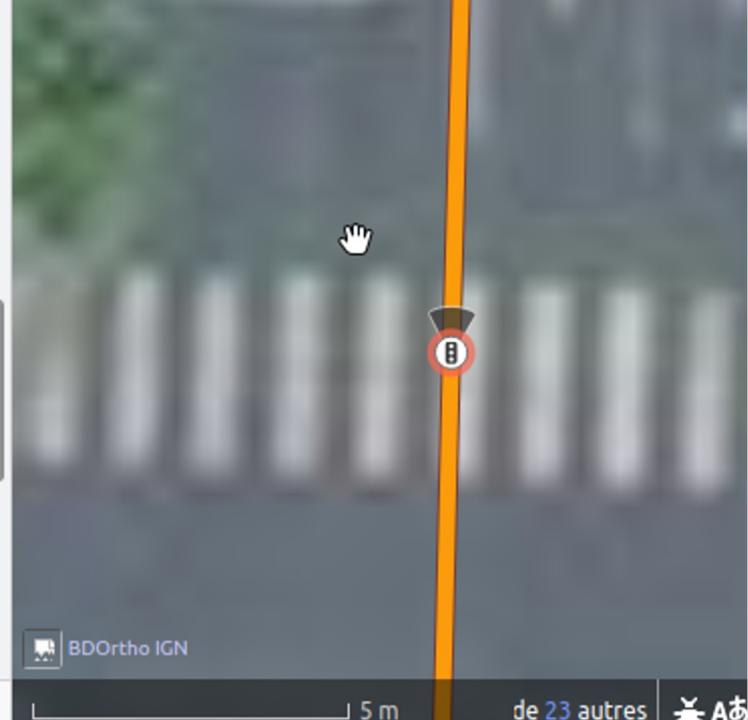
[Consulter sur openstreetmap.org](#)

Source : OpenStreetMap contributors

Data model

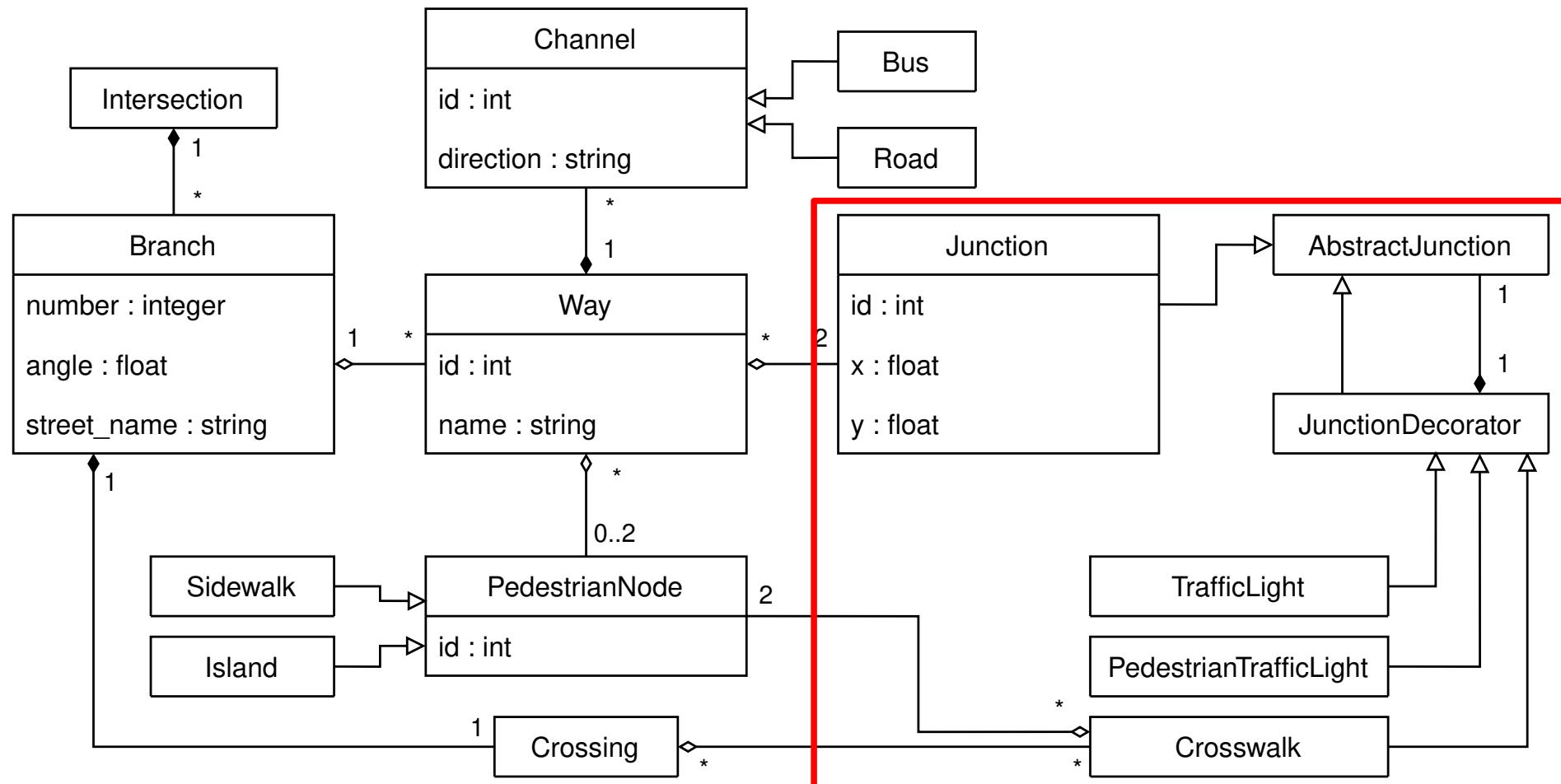
button_operated	no		
crossing	traffic_signals		
crossing:island	no		
highway	traffic_signals		
kerb	lowered		
source	Orthophotographie CR ...		
supervised	no		
tactile_paving	yes		
traffic_signals	signal		
traffic_signals:direction	forward		
traffic_signals:sound	no		

[Consulter sur openstreetmap.org](#)

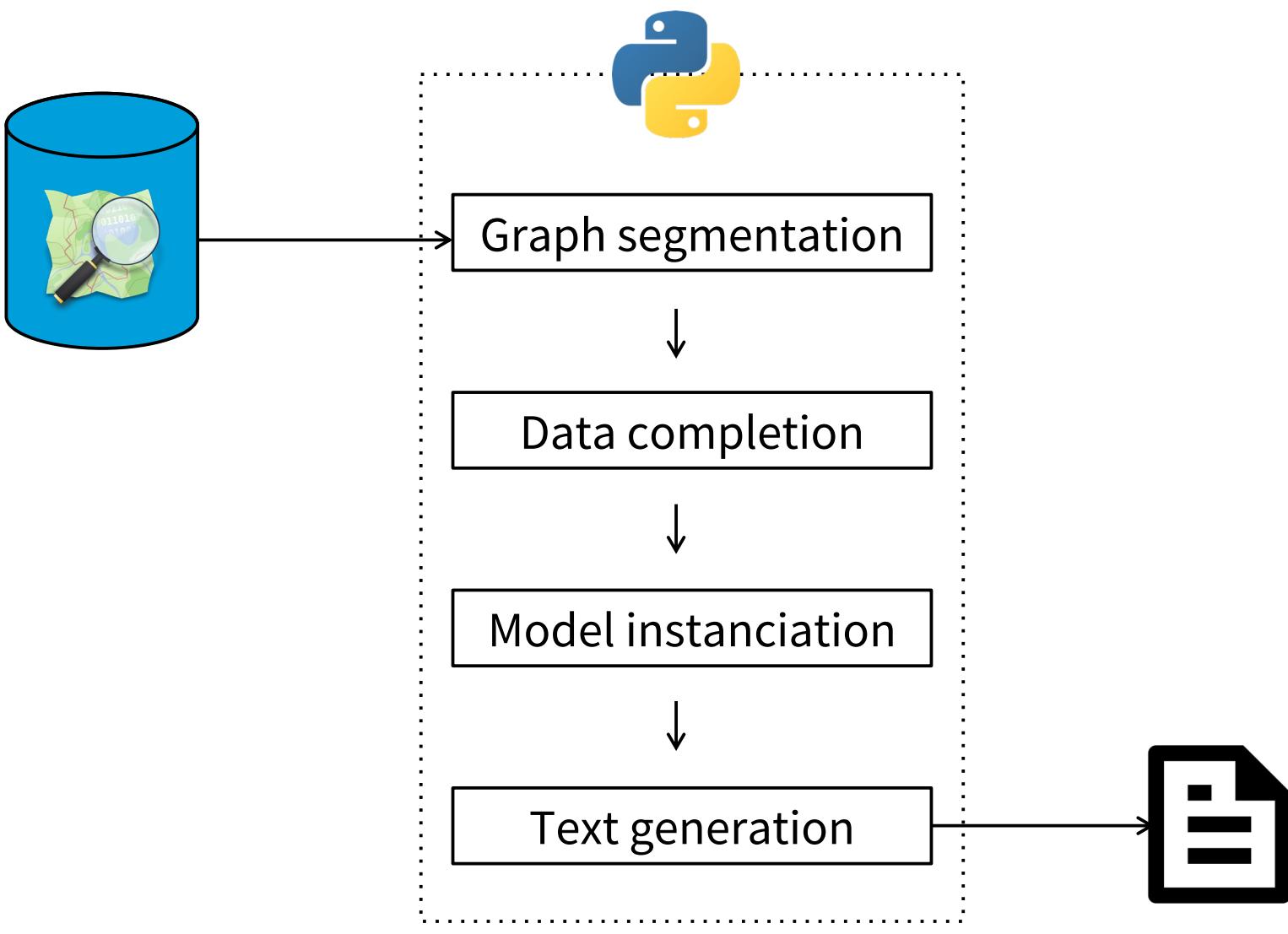


Source : OpenStreetMap contributors

Data model



Data model

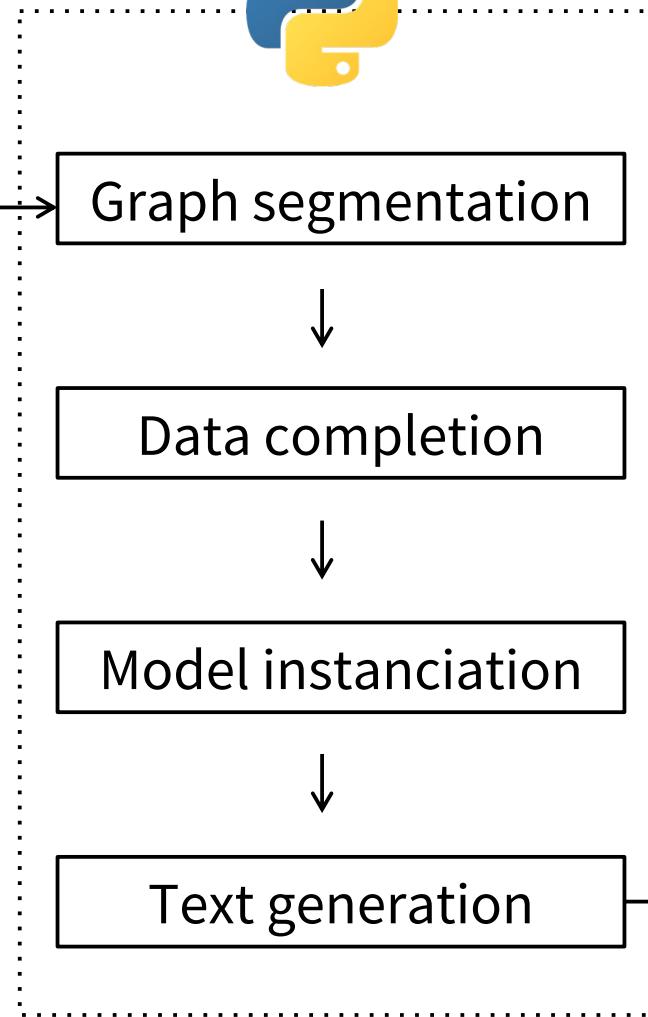
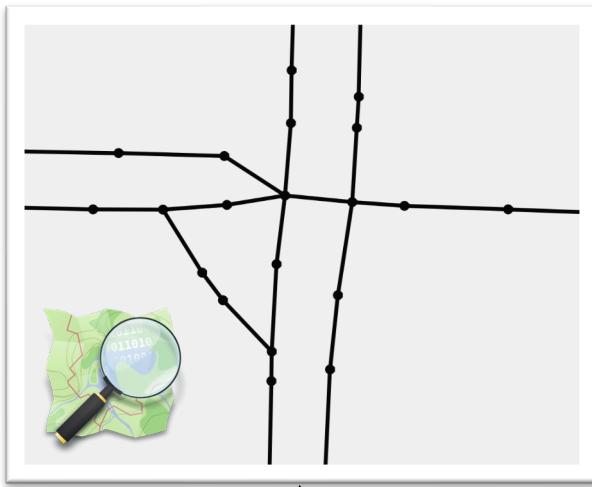


Exemple for an intersection

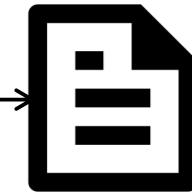


Source : CRAIG – IGN – Feder Auvergne-Rhône-Alpes 2019

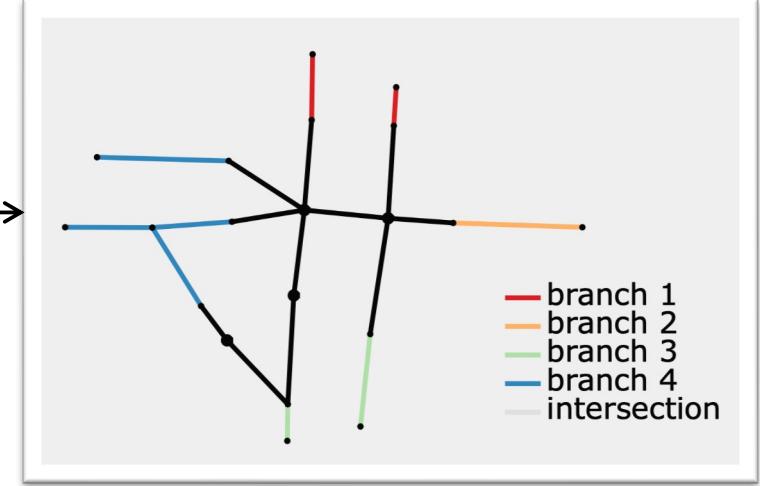
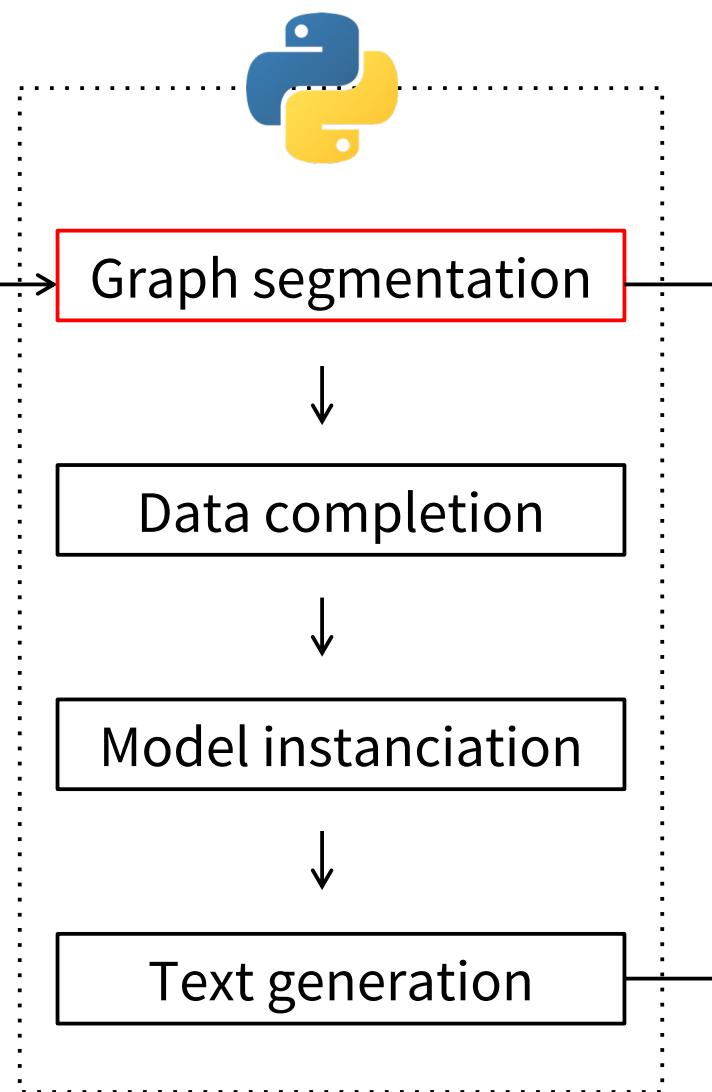
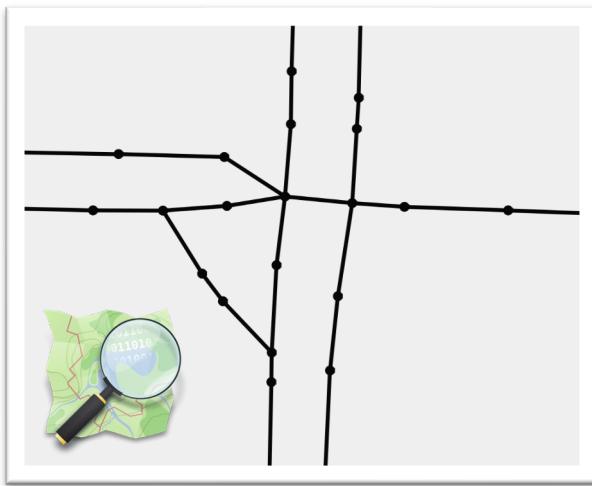
Exemple for an intersection



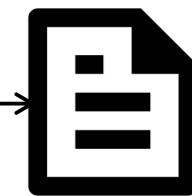
Boeing, G.: OSMnx: New methods for acquiring, constructing, analyzing, and visualizing complex street networks, Computers, Environment and Urban Systems, 65, 126–139.



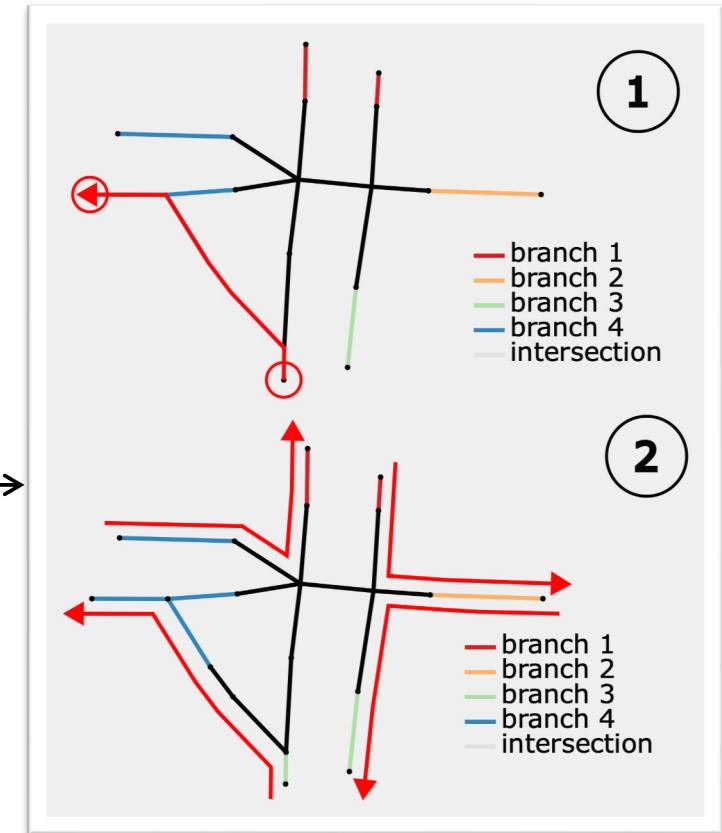
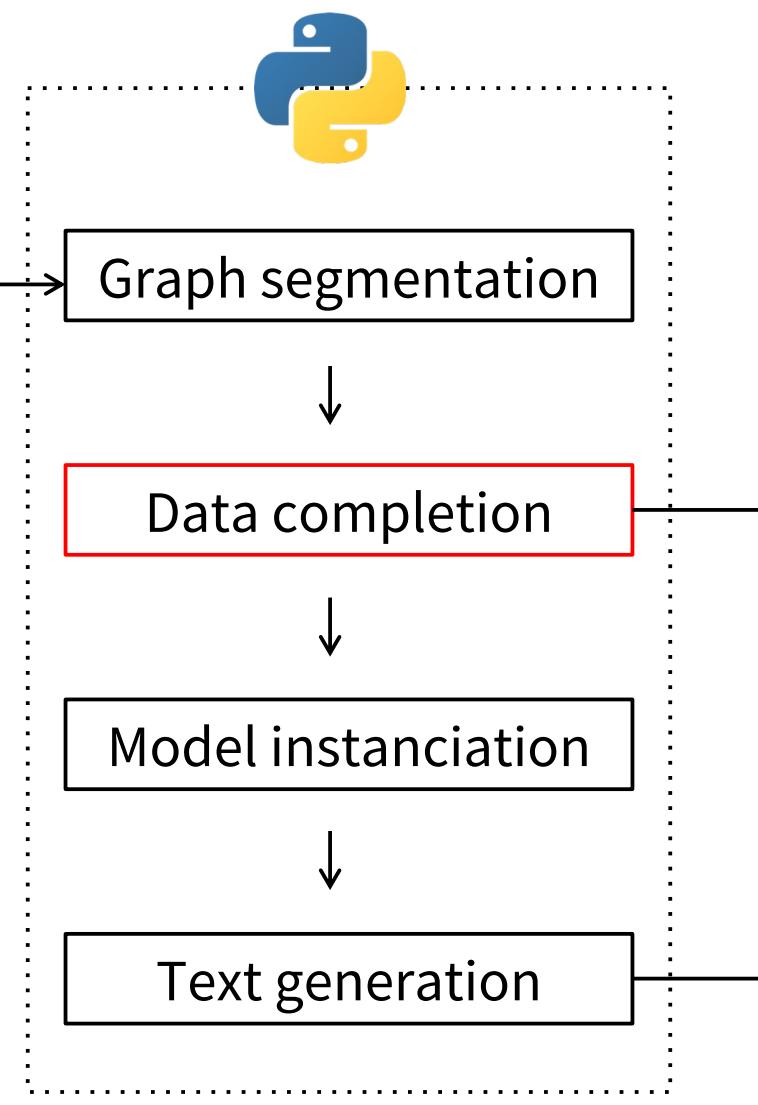
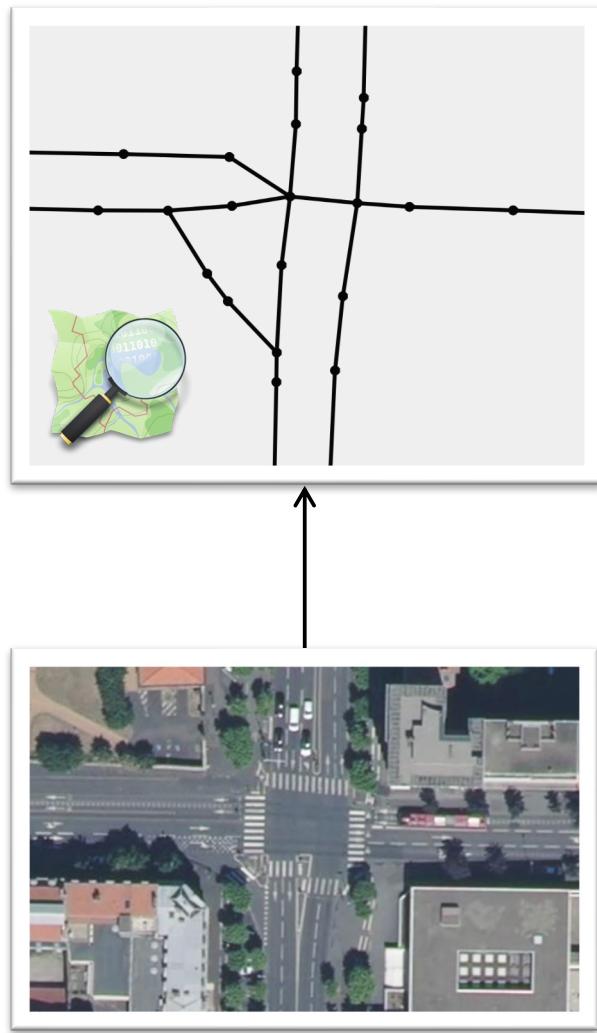
Exemple for an intersection



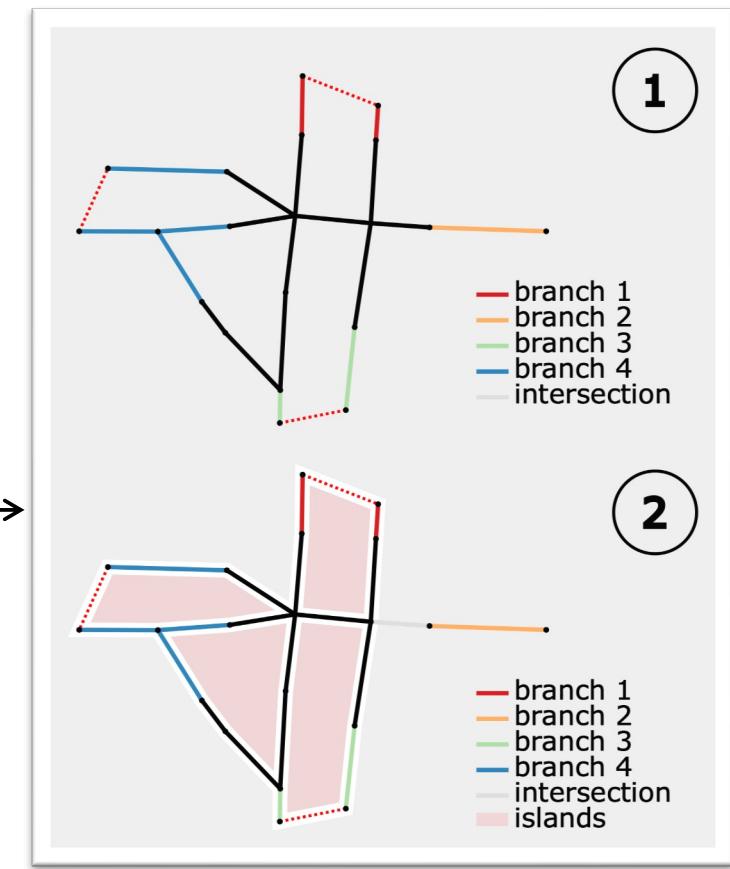
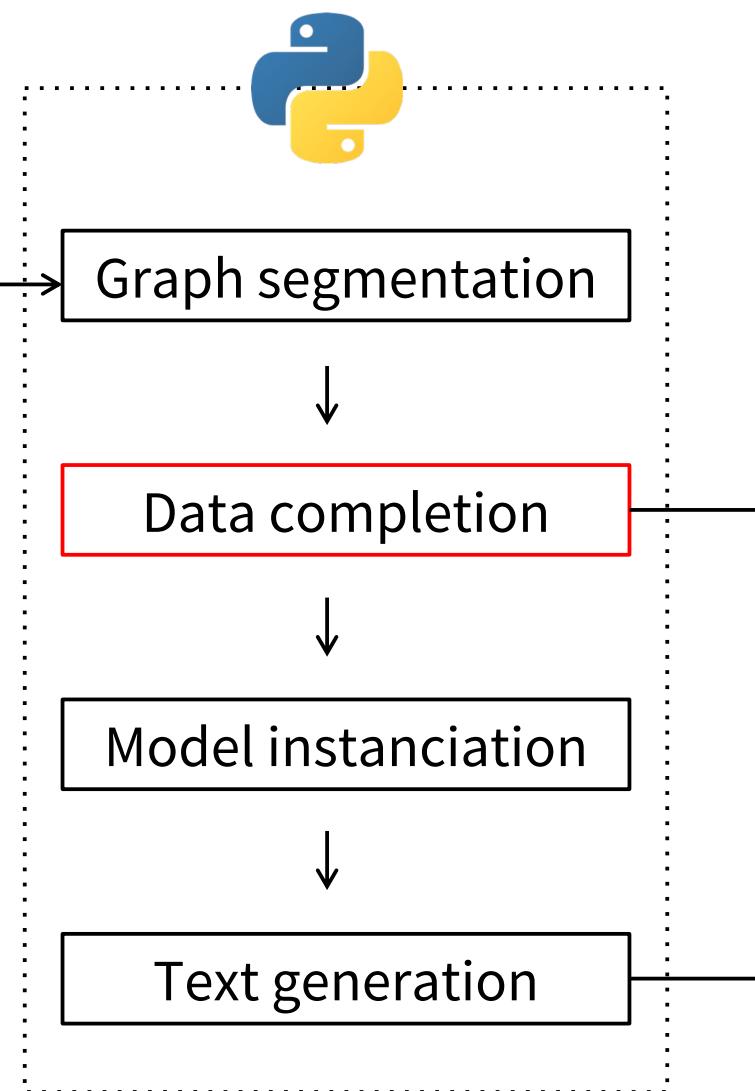
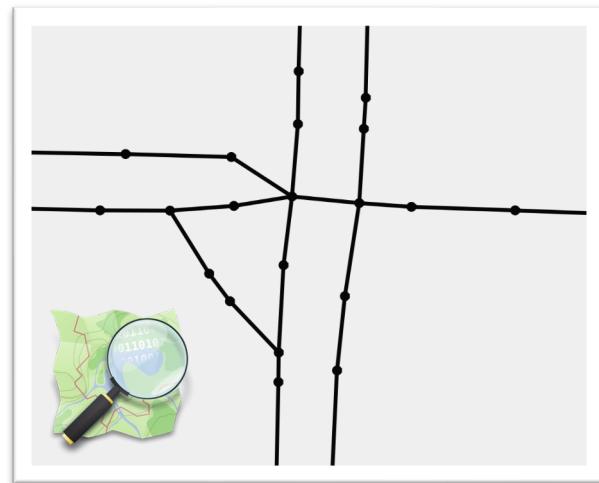
Favreau, J.-M. and Kalsron, J.: What are intersections for pedestrian users ?, in: Proceedings of the 25th AGILE Conference, Vilnius, Lithuania, 2022



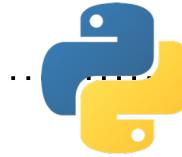
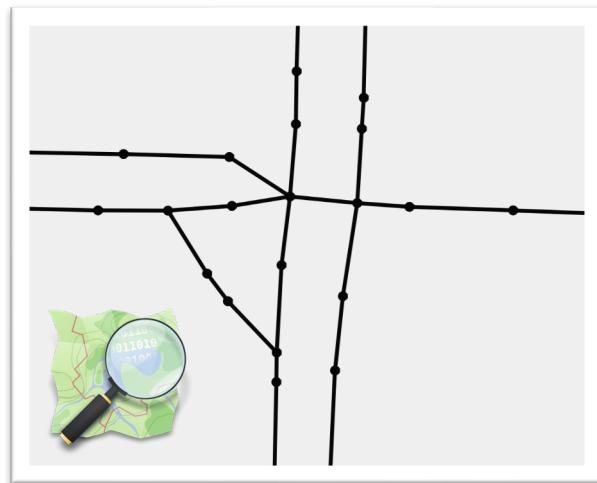
Exemple for an intersection



Exemple for an intersection



Exemple for an intersection



Graph segmentation



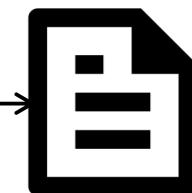
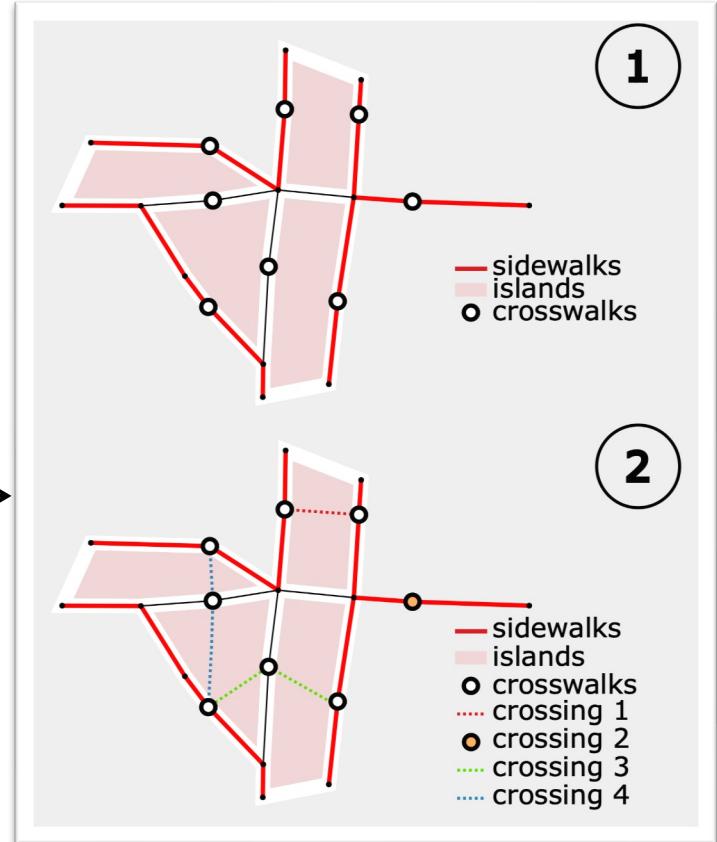
Data completion



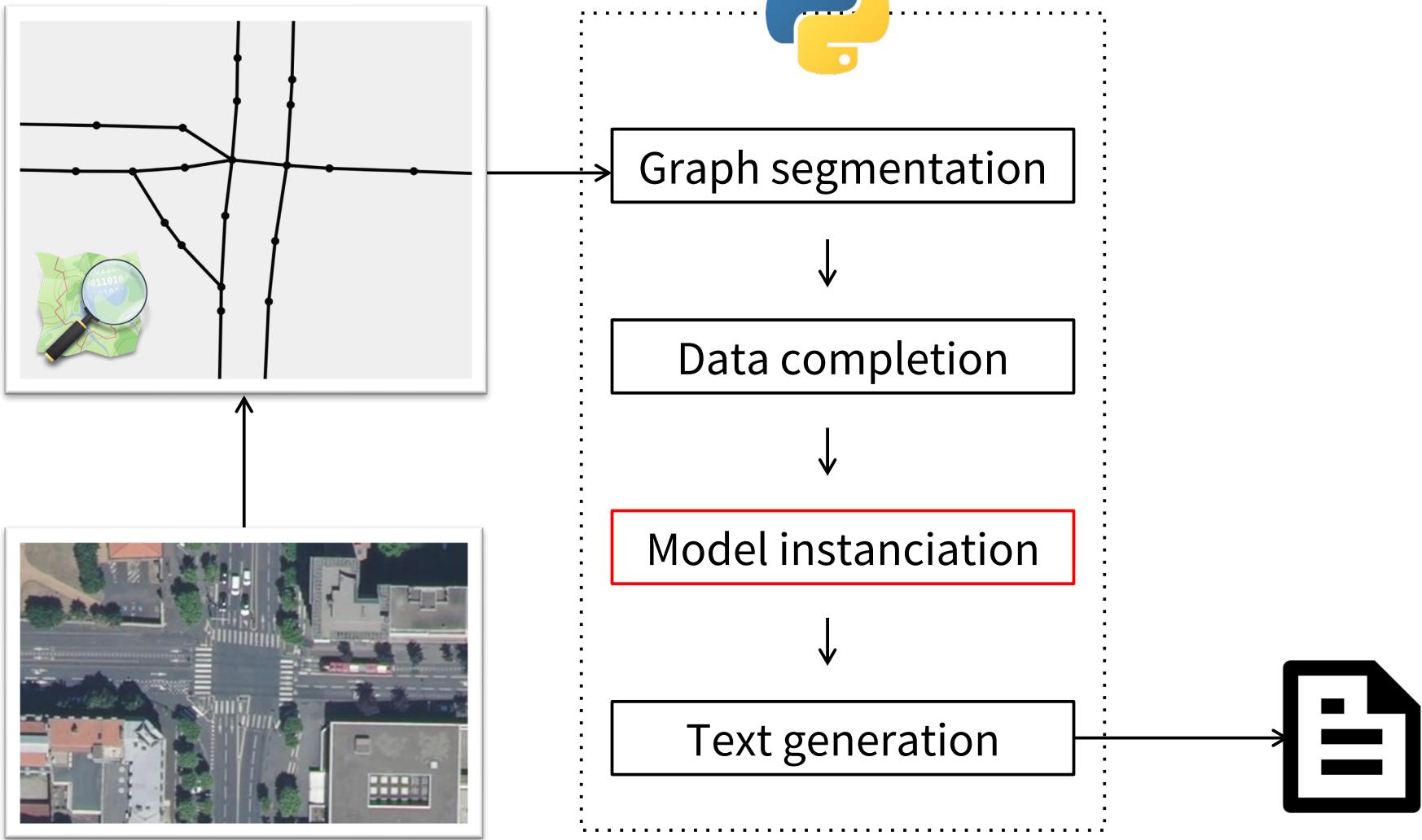
Model instantiation



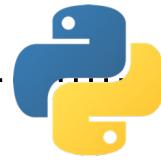
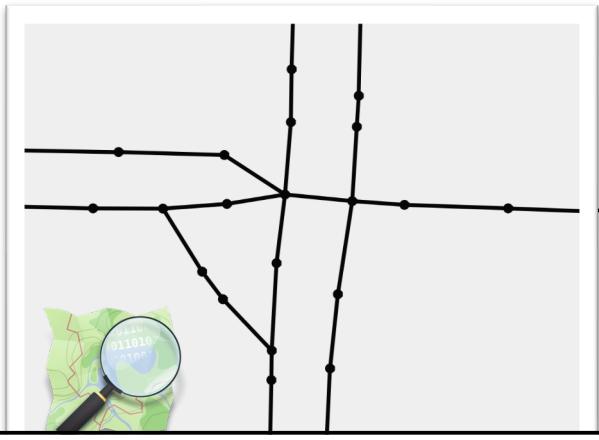
Text generation



Exemple for an intersection



Exemple for an intersection



Graph segmentation



Data annotation

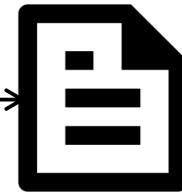
```
junction = Junction(id,x,y)  
junction = Crosswalk(junction, cw_tactile_paving = "yes")  
junction = Traffic_light(junction)
```



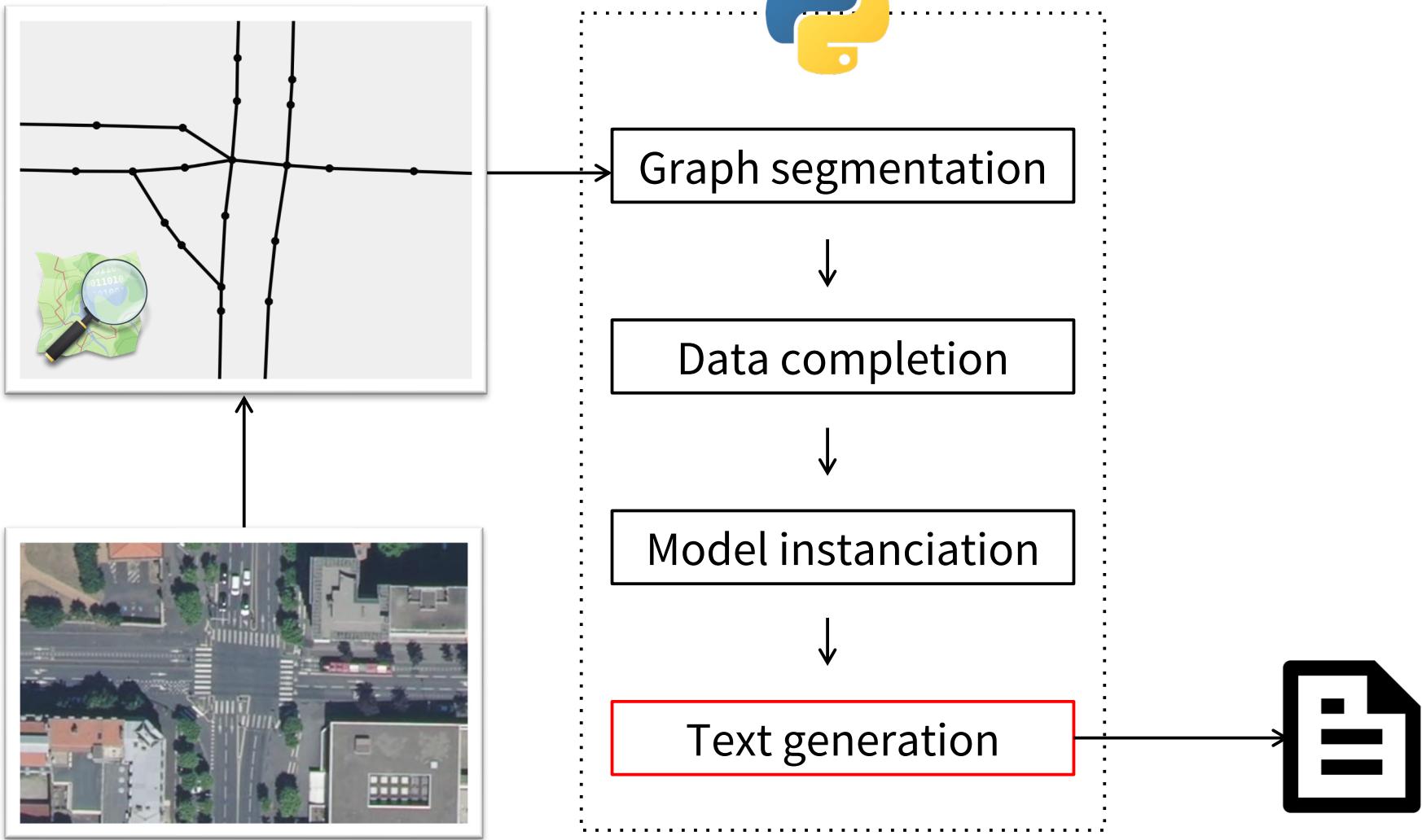
Model instantiation



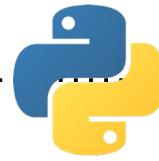
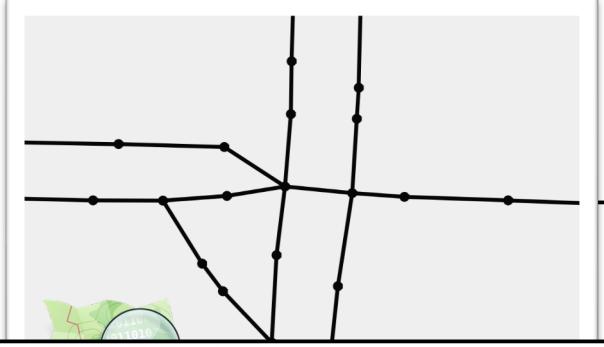
Text generation



Exemple for an intersection



Exemple for an intersection



Graph segmentation

Molins, P. and Lapalme, G.: JSrealB: A Bilingual Text Realizer for Web Programming, pp. 109–111.

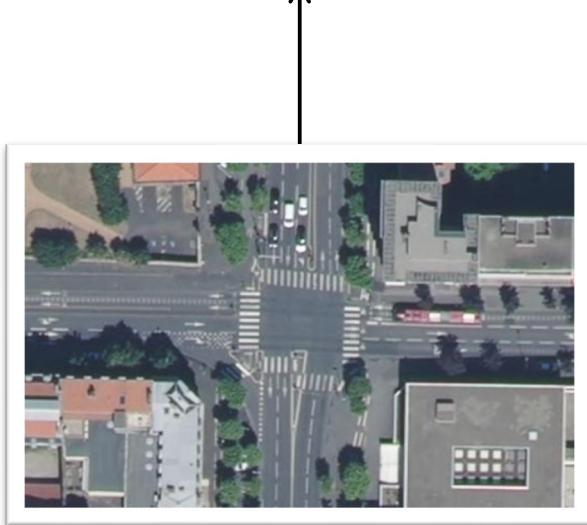
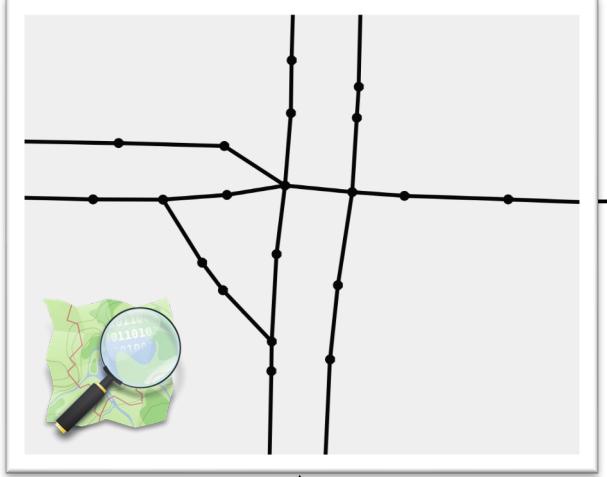
```
for street in streets:  
    s.add(  
        PP(  
            P("de"),  
            NP(  
                D("le"),  
                N(street[0]),  
                Q(street[1])  
            )  
        )  
    )  
general_desc = "Le carrefour à l'intersection %s est un carrefour à %s branches."%(jsRealB(s), len(crossroad.branches))
```



Text generation



Exemple for an intersection



The intersection between Cours Sablon and Avenue Carnot is a 4-branches intersection.

== Branches description ==

The branch number one named cours Sablon is composed of three outgoing car lanes, and one incoming car lane.

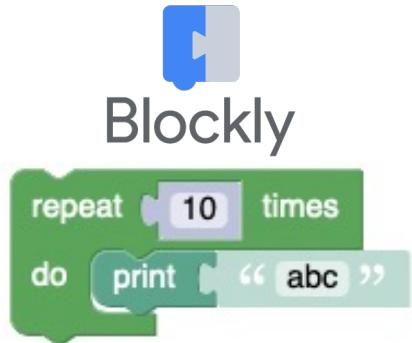
(...)

== Crossings description ==

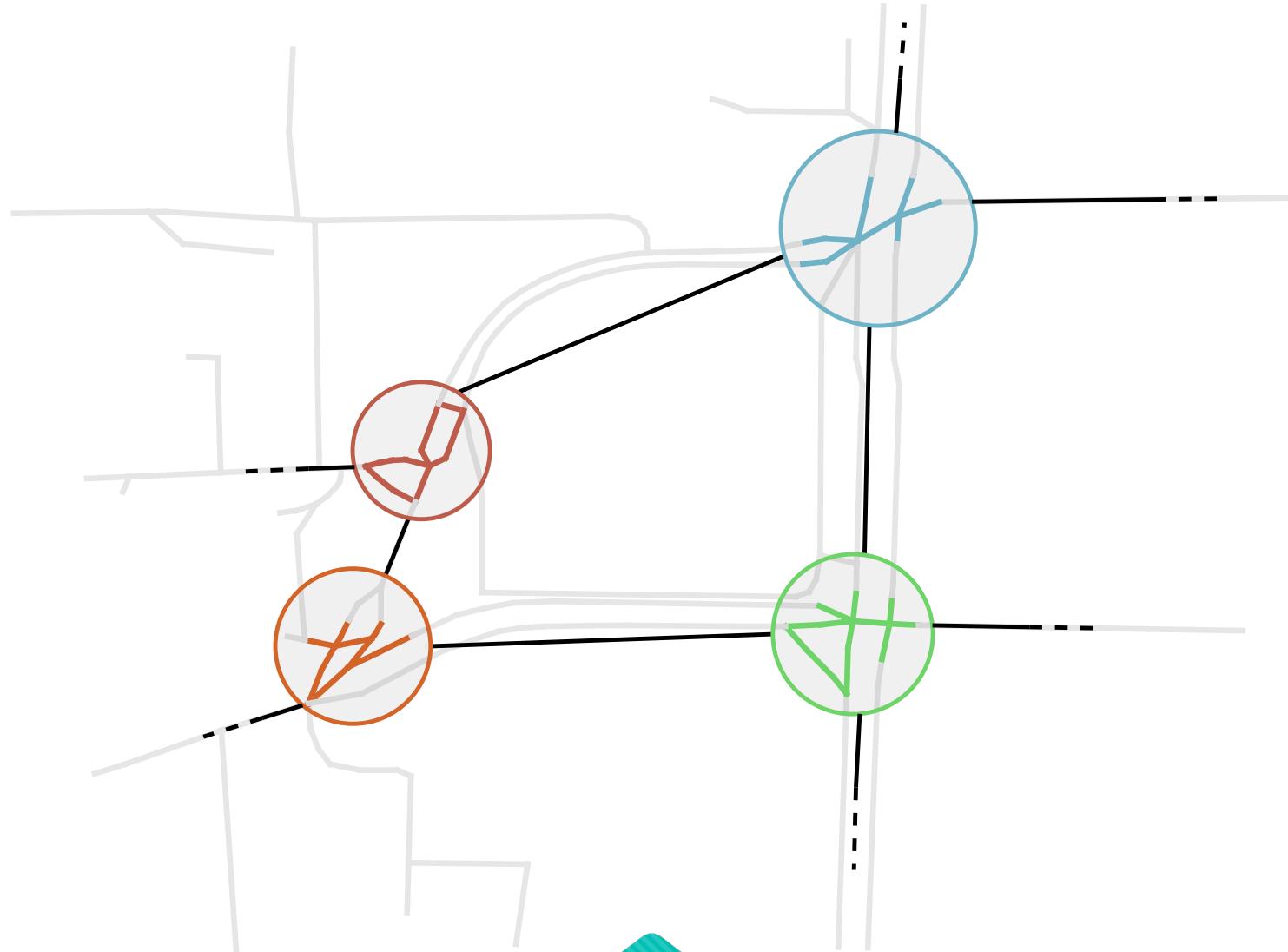
The branch number one can be crossed in two times. All crosswalks are protected by a traffic signal. There are tactile pavings.

(...)

Exemple for an intersection



Future researches



Future researches

CrossroadsDescriber

Automatic Textual Description of OpenStreetMap Intersections

○ J. Kalsron¹, J.-M. Favreau¹, G. Touya²

○ [1] Université Clermont Auvergne, CNRS, Mines de Saint-Étienne,
Clermont-Auvergne-INP, LIMOS, F-63000, Clermont-Ferrand, France.

○ [2] LASTIG, Université Gustave Eiffel, ENSG, IGN, F-94160, Saint Mandé,
France.

Contact : jeremy.kalsron@uca.fr



@norslakj



ACTIVmap

ANR

AGENCE
NATIONALE
DE LA
RECHERCHE

0'0 0'0 0'0 0'0
0'0 0'0 0'0 0'0
LIMOS
0'0 0'0

