

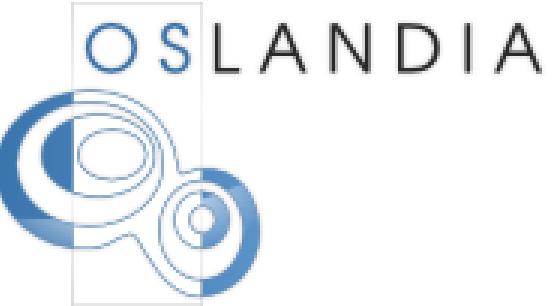


iTowns

WebGL 3D visualization framework

**Vincent Picavet
Oslandia**

Oslandia



- «Pure player» OpenSource
- Since 2009
- 11 collaborators (>+30% / year)
- French company
- FOSS4G contributions :
PostGIS, SFCGAL, QGIS, Tempus,
TinyOWS, GDAL/OGR, PgPointCloud,
iTowns...

iTowns ?

towns⁺

149, r du temple, Paris | Easting : 652959.62 - Northing : 6862849.45 (lambert 93)

PLAN

Couches



COUCHES

OUTILS

MESURE

Point Line Volume

Classe:

F Snap Sidewalk Zebra



iTowns ?

WebGL / Javascript Framework

3D Visualization

Immersive navigation

All types of GIS data

OpenSource (Cecill-B & MIT)



Technical basis

(iTowns 1.0 & 2.0)

JavaScript

WebGL

THREE.js

Shaders

iTowns : client-side
only



JavaScript

three.js ^{r77}

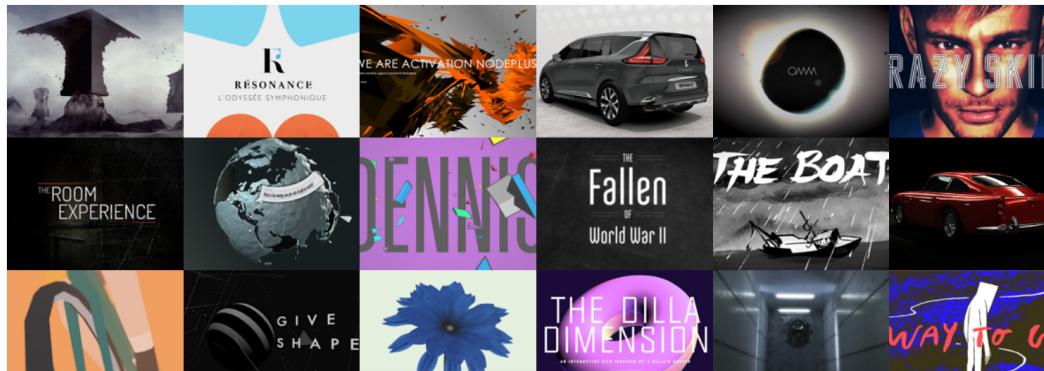
documentation
examples

download

github
stackoverflow
irc

editor

featured projects



iTowns project - step 1/4



IGN 2008

MATIS Research laboratory (IGN)
Flash application



- Panoramic images visualization
- Object annotations
- LIDAR PointClouds

iTowns project - step 2/4

2011 : new foundation

→ WebGL, GPU

- LIDAR / big volumes
- Mesh support

→ Stereopolis vehicle



Stereopolis (IGN)

«Mobile Mapping»

Sensors :

- Images
- LIDAR
- IMU
- GPS
- Speed



Sensors

images



LiDAR



Platform / vehicle



IMU / GPS

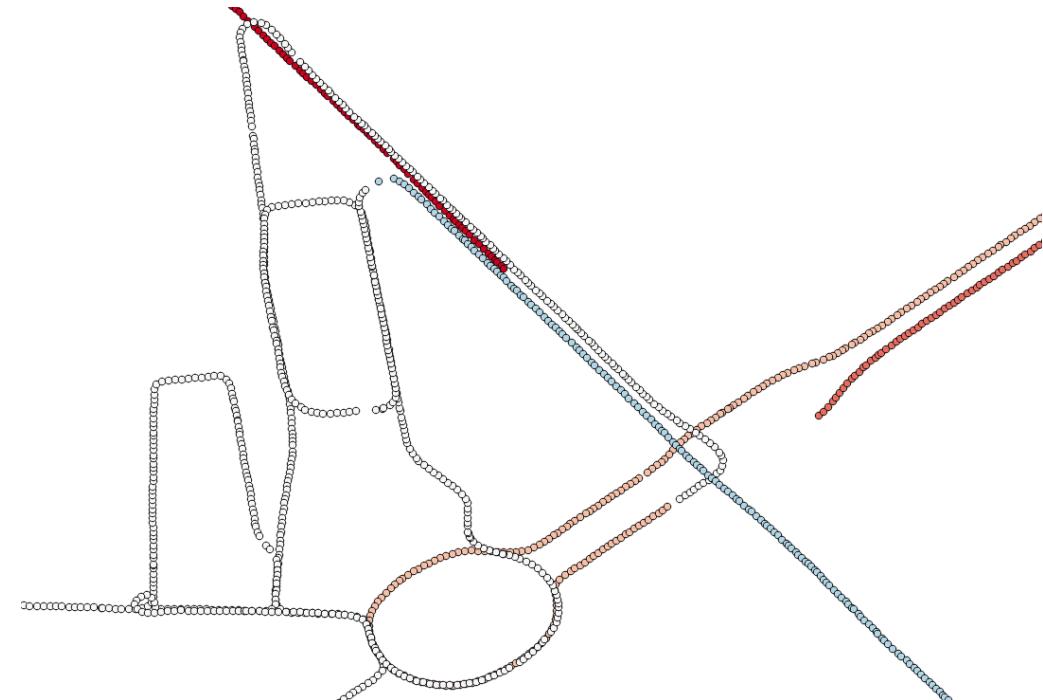
Sensors

Trajectory (IMU) + GPS + odometer
→ position + orientation @ 200Hz

Images → 9 Images / 2m

Laser → 300K points / s

iTowns goal : Visualize
these data !



iTowns OpenSource - step 3/4

08/2015 : decision to go opensource

... : 1.0 source code cleaning

: first 2.x commits

02/2016 : Version 1.0 release

: PSC

1.0 → operational & «Technology preview»

2.x → under (heavy) development



This repository

Search

Pull requests Issues Gist



iTowns / itowns

[Unwatch](#) 21[Unstar](#) 25[Fork](#) 11[Code](#)[Issues 8](#)[Pull requests 0](#)[Wiki](#)[Pulse](#)[Graphs](#)[Settings](#)iTowns is a JS/WebGL framework for 3D geospatial data visualization — [Edit](#)

83 commits

3 branches

1 release

6 contributors

Branch: **master**[New pull request](#)[New file](#)[Upload files](#)[Find file](#)[SSH](#)

git@github.com:itowns/it

[Download ZIP](#)

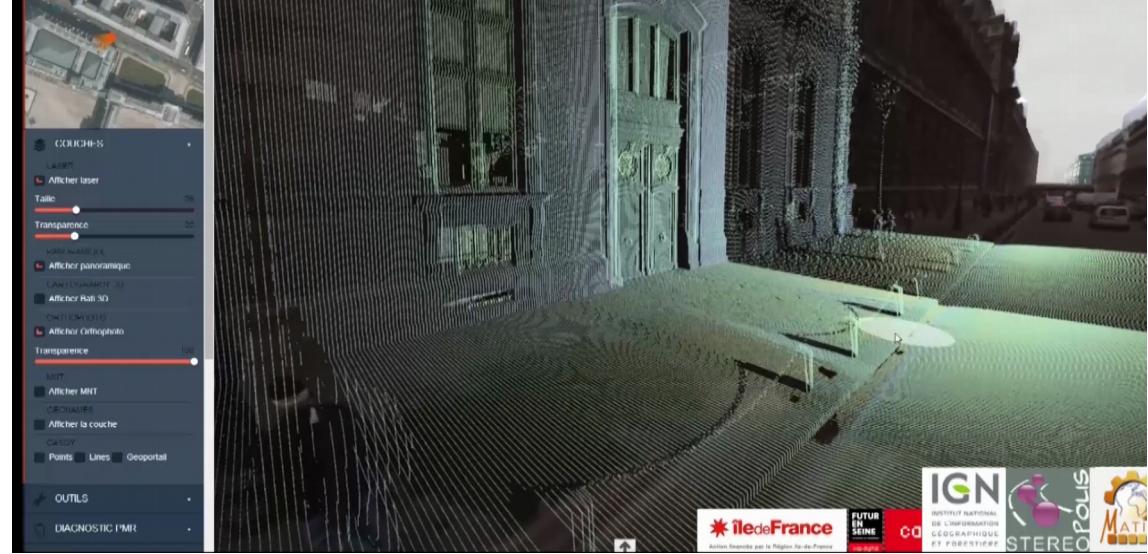
nosy-b nothingefe

Latest commit 9539180 on 30 Mar

	examples	Add all sources	3 months ago
	fonts	Add all sources	3 months ago
	icons	Add all sources	3 months ago
	images	Image mask support (single panoramic for now)	3 months ago
	nbproject	nothingefe	a month ago
	scripts	git push fix without ssh key setup in deploy script	3 months ago
	shaders	Add all sources	3 months ago
	src	correct bugs positionInit	a month ago
	.gitignore	Use webpack instead of RequireJS	3 months ago
	.npmignore	Use webpack instead of RequireJS	3 months ago
	LICENSE.md	Add all sources	3 months ago

Data types

- Oriented images
- PointClouds
- Extruded buildings (2D → 3D)
- Meshes (3D buildings with textures)
- Webservices
WMTS (terrain, aerial imagery...)



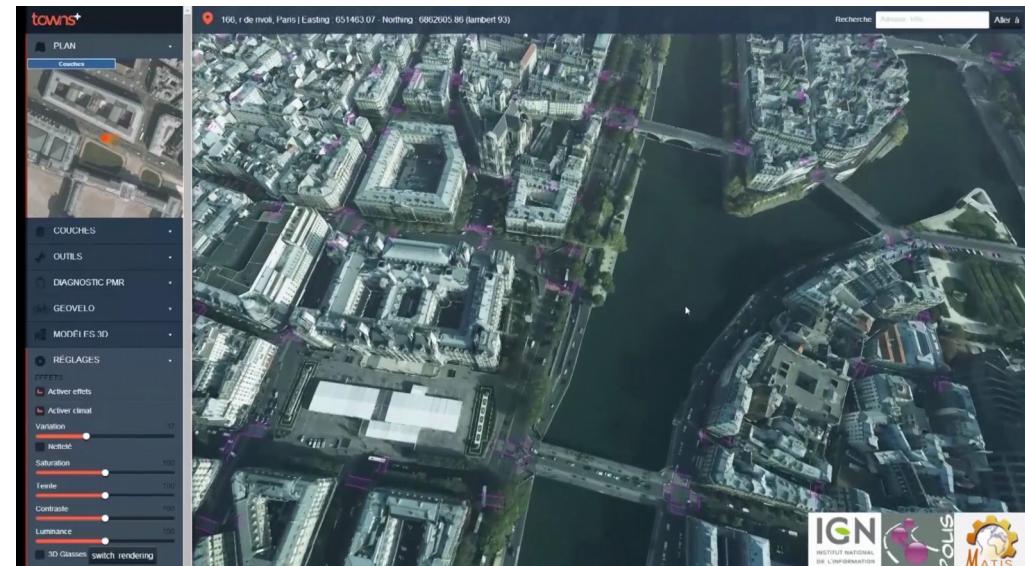
Data samples

Data subset : one neighborhood of Paris

Quality : high (600MB) & low (60MB)

CC-By-NC-ND-3.0

- 3D textured mesh
- Oriented images
- LIDAR (mobile map.)
- Vector data
elevation,
2D building footprints



Oriented images

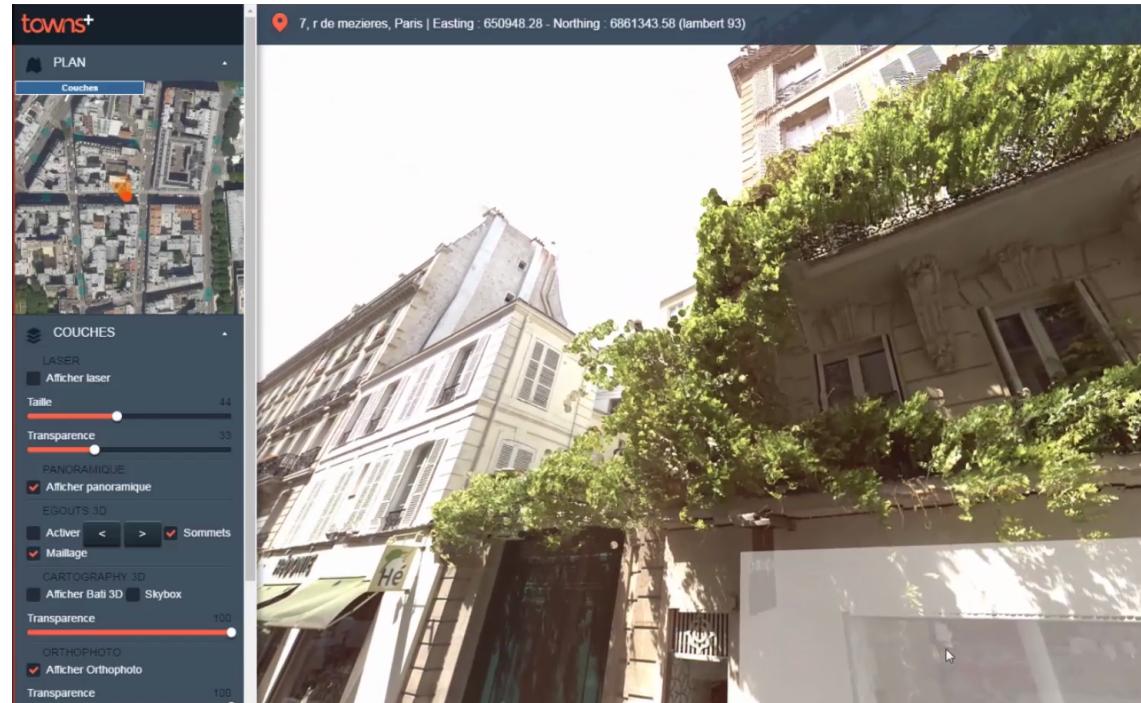
Images with position & orientation

Projection on :

- Extruded 2D buildings
- Meshes

Free navigation

More precision





mm-50.jpg



mm-51.jpg



mm-52.jpg



mm-53.jpg



mm-54.jpg



mm-55.jpg



mm-56.jpg



mm-57.jpg



mm-58.jpg



mm-59.jpg



mm-60.jpg



mm-61.jpg



mm-62.jpg



mm-63.jpg



mm-64.jpg



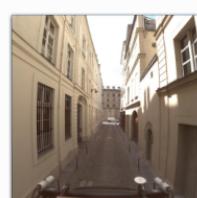
mm-65.jpg



mm-66.jpg



mm-67.jpg



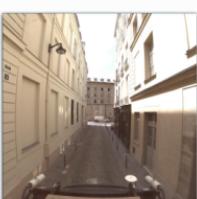
mm-68.jpg



mm-69.jpg



mm-70.jpg



mm-71.jpg



mm-72.jpg

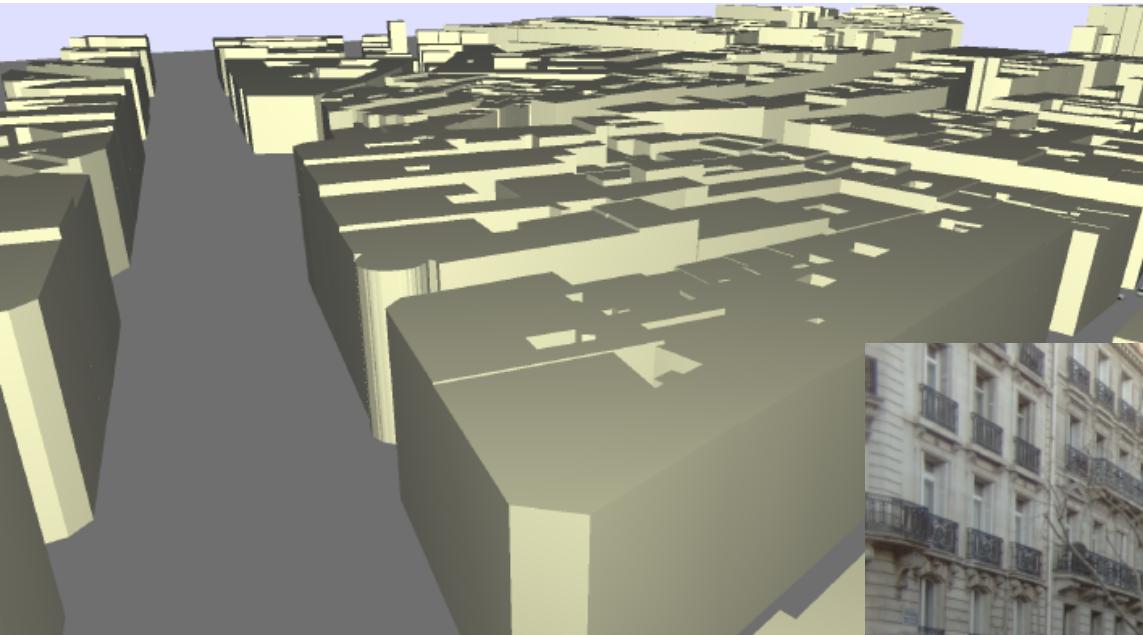


mm-73.jpg

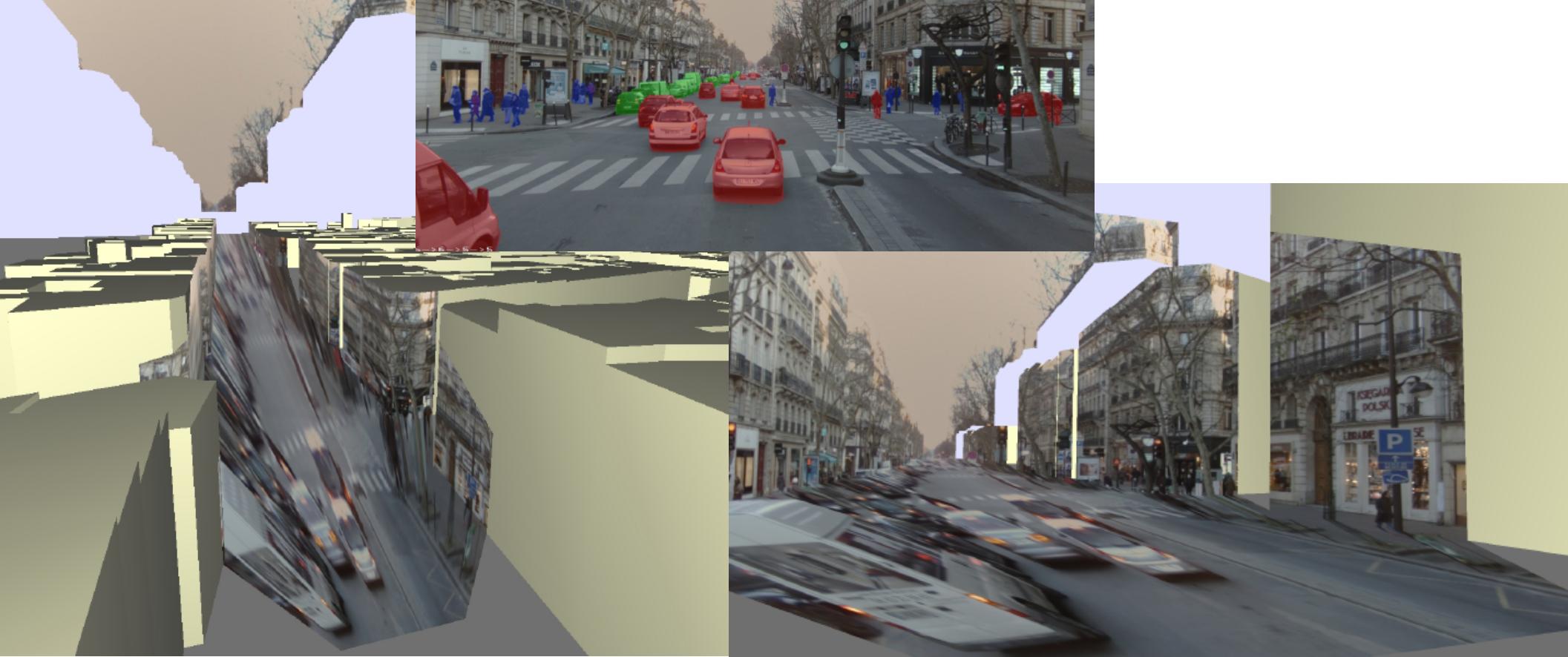


mm-74.jpg

Oriented images



Oriented images



iTowns v2.x - step 4/4

Full refactoring

Globe

High level API

Webservices : WMTS, WMS, WFS

Documentation & examples

3D Meshes (KML, glTF...)

Roadmap : **Alpha late 2016 // 2.0 early 2017**



Video

Use cases

iTowns v1.0 + iTowns v2.0

Future - features

Potree integration → almost done

Projected images on PointClouds → PoC

Build system & CI → under work

End-user interface



Future - features

External API integration

- HERE
- Mapillary, others ?

Vector tiles support

3D services connection

- 3D Tiles support
- Greyhound / Entwine

Server-side



LI³DS
LI³DS is an OpenSource project by Oslandia and IGN for 3D scanning and data management
 France  infos+li3ds@oslandia.com

 **Repositories**  People 8  Teams 0  Settings

Filters  Find a repository... 

PDAL   0  105
 forked from [PDAL/PDAL](#)
PDAL is Point Data Abstraction Library. GDAL for point cloud data.
Updated 8 days ago



api-li3ds   0  0

People 8 >





Server side

→ *Streaming*

3D web services

- PointClouds
- 3D objects (buildings...)
- Mesh (& quantized mesh)
- Oriented images
- 360° images

+ 3D Tiles support



Server-side : LOPoCS

(Light OpenSource PointCloud Server)



→ Streaming point clouds from PostgreSQL

PgPointCloud / PostGIS

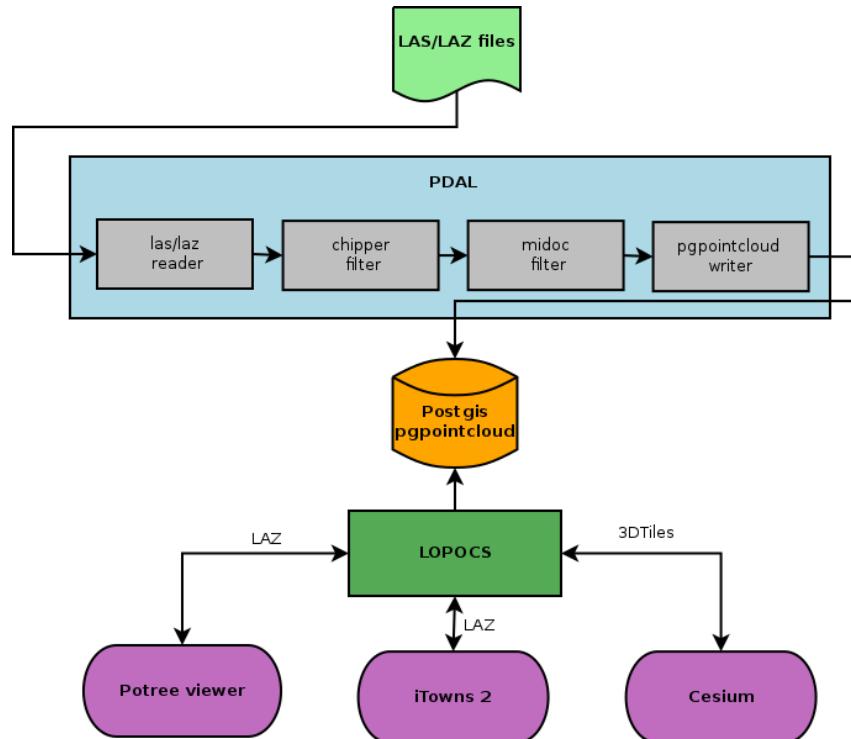
Python / Flask API

LAZ output (= Greyhound)

3D Tiles output

(=> OGC community standard)

<https://github.com/LI3DS/lopocts>



Server side



Data type	OpenSource Software components	3DTiles support ?
3D Objects (buildings...)	Oslandia Building-server // Collada2bgltfConverter // 3DT Tools	Static only
Mesh (& quantized mesh)	Cesium Terrain Builder	Not in spec yet
Point Clouds	LOPoCS // Greyhound/Entwine // Cesium pnt generator	Static & dynamic
Oriented images	LI3DS API (coming soon)	Not in spec yet
360° images	LI3DS API (coming soon)	Not in spec yet

Future - data workflow

Tools for data preparation

Support for various formats

Ease of setup

- start simple, scale later
- full stack packaged (e.g. Docker)

<= We need sample data

<= We need real-world use cases

< HELP HERE !

Future - project

Version 2.0

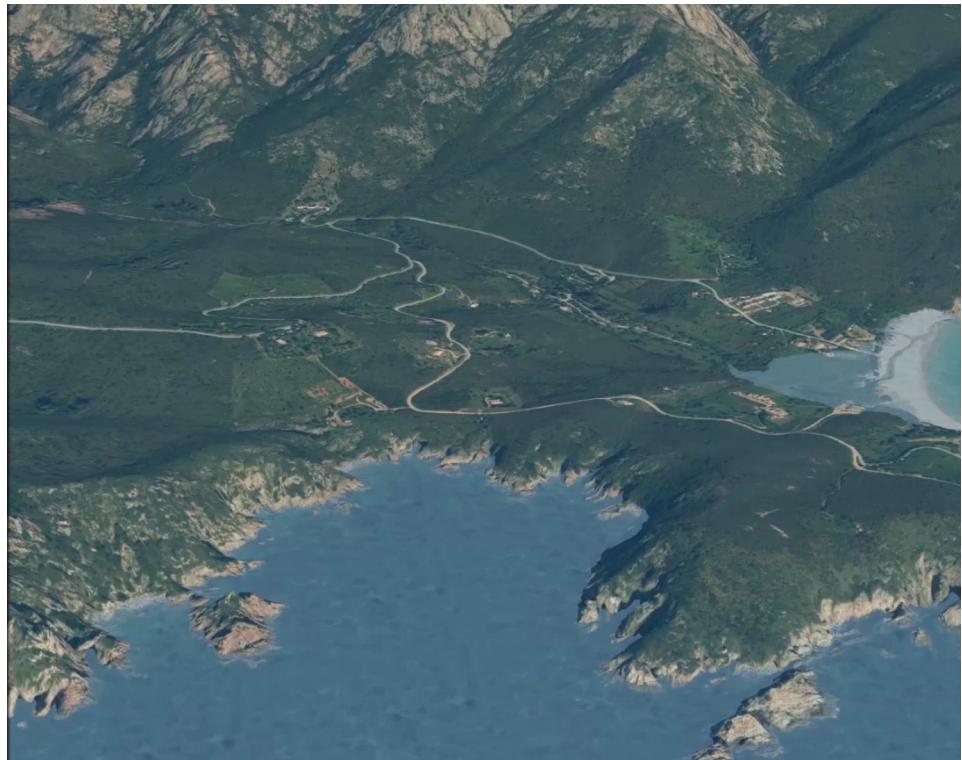
Code quality

Industrial projects

More contributors

Communication

Funding



**Merci,
Thanks,
Questions ?**



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@Oslandia_fr

<http://github.com/iTowns/itowns2>

<http://www.itowns-project.org>

<http://www.oslandia.com>

iTowns vs Cesium ?

- Space to street / street to space
- Maturity level
- Immersive visualization in iTowns
- Pure WebGL / THREE.JS

Requêtes

- Tuile A niv + 1
- Tuile B niv + 1

