



WORKING BY YOUR SIDE
TO TACKLE YOUR CRITICAL CHALLENGES

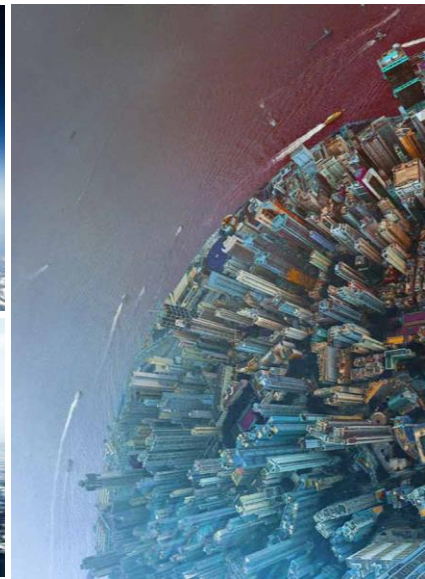


FOSS4G

FIRENZE 2022

Iota2
Large scale land cover
mapping

Julien Osman
August 24th 2022

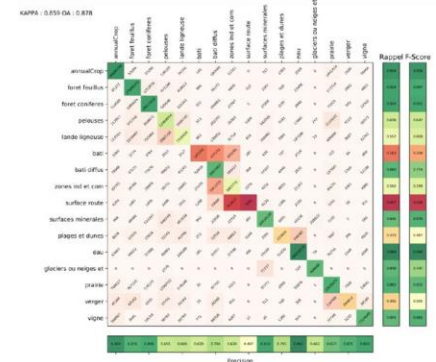


IOTA2: EO-ML FRAMEWORK FOR LAND COVER MAPPING AT LARGE SCALE

- Iota2 can manage
 - OPTICAL (S2 L2A, L3A) and SAR times series (S1 IW GRD)
 - Large spatial area
 - Model spatial stratification
 - Multithreading (OTB) + Distributed processing : local & HPC (dask)
- Operational - OSO product :
 - Annual
 - 23 classes
 - CNES HPC environment
- Open-source project
 - <https://framagit.org/iota2-project/iota2>
- Based on python stack and OTB



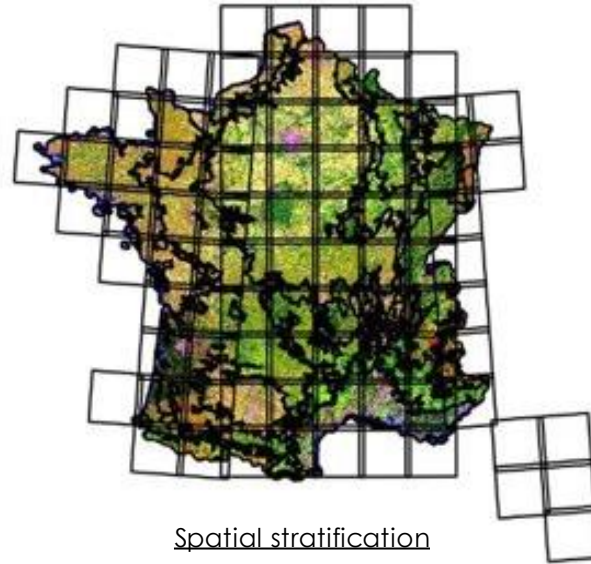
OSO product



Output report

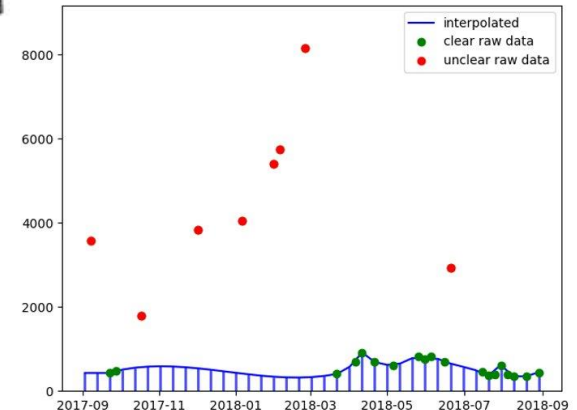
LARGE SCALE MANAGEMENT

- Heterogeneous acquisitions
 - Sensors acquisition dates
 - Clouds
- Several Ecological areas
- UTM projections
- Solution: time interpolation
 - Smooth signal by using masks (clouds) to remove outlier pixels
 - Homogenize data by placing every pixels with the same time step



Number of acquisition per pixels. OSO products

Dark grey: low number of view / White: high number of view



Pixel time series, before and after interpolation

CLASSIFICATION

- Pixel classification

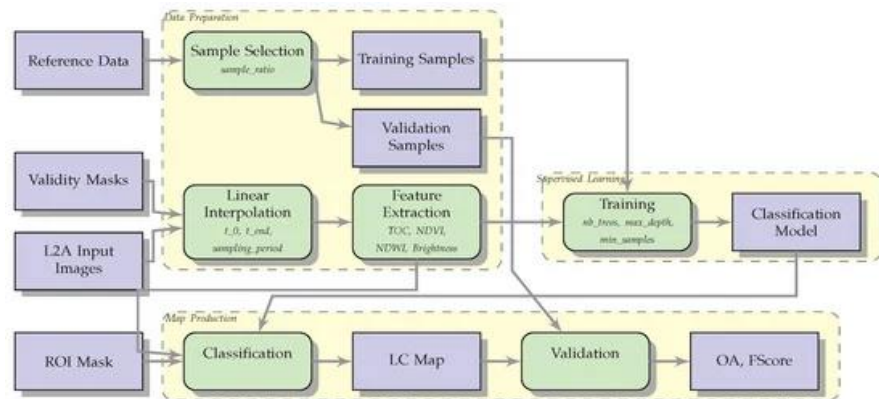
- OTB classifiers : RF, SVM...
- Scikit learn
- Pytorch

- Object Based Image Analysis

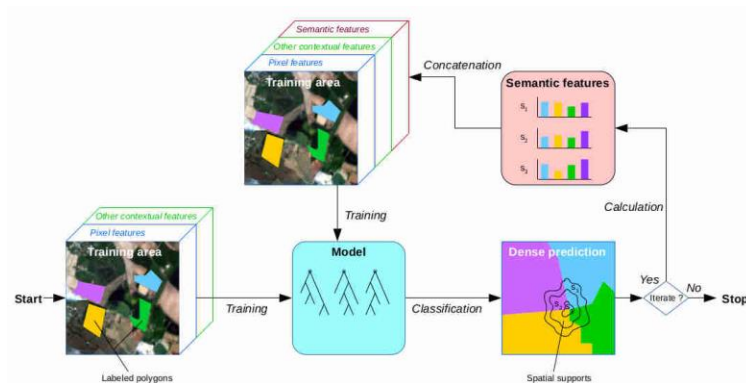
- Input Segmentation
- All classifier used for pixel
- https://docs.iota2.net/master/i2_obia_tutorial.html

- Auto-context

- Random forest using super-pixels
- <https://docs.iota2.net/master/autoContext.html>



Supersized classification workflow



Auto-context classification workflow

TO SUMMARIZE

- You may need `iota2` if
 - You are working with more than one tile
 - You are using open remote sensing data
 - You have “good quality” reference data
 - You are using GNU/Linux (no Microsoft Windows support provided)
 - You want an “easy to install processing chain”
- Information
 - Documentation : <https://docs.iota2.net/master/>
 - Request, Bug report, question <https://framagit.org/iota2-project/iota2/-/issues>