What's new in OTB?

User days 2021
OTB releases

- 7.0 (10/2019)
- 7.1 (03/2020)
- 7.2 (09/2020)
- 7.3 (05/2021)
- 7.4 (09/2021)
- 8.0 alpha 1 (02/2021)
- 8.0 alpha 2 (11/2021)
- 8.0
OTB 7: New applications

• Regression framework
  • TrainVectorRegression (7.0)
  • TrainImagesRegression (7.0)
  • VectorRegression (7.0)
  • ImagesRegression (7.0)

• Hyperspectral Image processing
  • LocalRxDetection (7.0)
  • EndmemberNumberEstimation (7.0)
  • SpectralAngleClassification (7.2)

What’s new in OTB 7?
OTB 7: New applications

- Image processing
  - FastNLMeans (7.1)
  - PantexTextureExtraction (7.2)
- Utility
  - ZonalStatistics (7.0)
  - ResetMarging (7.2)
  - Synthetize (7.2)
OTB 7: SAR

• New SAR sensor models:
  • CosmoSkyMed
  • TerraSAR-X

• Remote modules:
  • Diapotb
  • S1-tiling

• Improvement of the Sentinel 1 model

What's new in OTB 7?
What's new in OTB 7?
OTB 7: Functor Image Filter

A generic filter for pixel based operations

• Takes any number of images or vector images as input
• Output an image or a vector image
• Operation based on pixel, neighborhood or a mix of both
• Operation defined using a lambda, functor or a function pointer

```cpp
// Define the filter
auto ndvi = [](double nir, double red) { return (nir - red) / (nir + red); };
auto ndviFilter = newFunctorFilter(ndvi);

// Set inputs (otb::Image)
ndviFilter->setInput1<nirImage>;
ndviFilter->setInput2<redImage>;

// Use the filter
ndviFilter->update();
```

Check out the "Functor application template" project on the Gitlab

What's new in OTB 7?
And also ....

- Support for GDAL 3
- Switch from Python 2 to Python 3
- Logs for the Python wrapper
- NoData extended filename for output images:
  
  &nodata=(double) value

- The Java wrapper has been removed

What's new in OTB 7?
OTB 8.0

Coming soon !
Ossim

An open source library for geospatial image processing

Ossim usage in OTB
• Spatial reference (refactored in OTB 7.0)
• Product metadata parsing
• DEM handling
• Time points and duration
• Sensor models:
  • SAR Sensor models
  • RPC model

What's new in OTB 8?
Ossim removal

Why are we removing Ossim from OTB?

• Hard to package (Debian, Conda, Superbuild)
• Hard to follow Ossim development cycle
• Many Ossim functionalities are also implemented in GDAL
Ossim Removal

Metadata parsing refactoring

**Goal**: Use GDAL as much as possible to handle metadata

- **Metadata parsing**
  - Read metadata from GDAL drivers when possible and from the product metadata files when needed
  - Support for geom files from OTB 7.0

- **Supported sensors**
  - Optical: Pleiades, Formosat, Worldview 2, Quickbird, Ikonos, Spot 5/6/7

*What's new in OTB 8?*
Ossim Removal

Metadata parsing refactoring

Metadata writing

- Metadata are written in the output image using GDAL
- OTB does not create geom files anymore

What's new in OTB 8?
Ossim Removal

Metadata parsing refactoring

Internally ...

- Ossim keywordlists have been replaced by `ImageMetadata`

- `ImageMetadata` stores different types of metadata:
  - `MDNum`: numerical values
  - `MDStr`: string
  - `MDTime`: dates
  - `MDL1D` and `MDL2D`: Lookup tables
  - `MDGeom`: RPC, SAR model, GCP, projection

```cpp
otb::ImageMetadata & imd = image->GetImageMetadata();
std::string id = imd[MDStr::SensorID];
bool hasDate = imd.Has(MDTime::ProductionDate);
imd.Add(MDNum::NoData, 999);
```
Use GDAL to read DEM and geoid files:

- Any monoband raster format supported by GDAL can be used as DEM
- The application elevation API is the same:
  - `elev.dem`: path to a directory containing DEM tiles
  - `elev.geoid`: path to a geoid file
  - `elev.default`: value used when no elevation info is available
- The C++ API is still based on a singleton

```cpp
go::DEMHandler::GetInstance()::OpenDEMDirectory(directoryPath);
double elevation = go::DEMHandler::GetInstance()::GetHeightAboveEllipsoid(lon, lat);
```

*What's new in OTB 8?*
Ossim Removal

RPC model

• RPC coefficient parsing is done by GDAL
• RPC transformation class based on GDALRPCTransform

SAR model

• SAR functionalities available in Ossim plugins have been reimplemented in OTB in SarSensorModel

Time points and durations

• Usage of std::chrono and of the Howard Hinnant date library

What's new in OTB 8?
Improvements of the QGIS plugin

What's new in OTB 8?

OTB 7.4

OTB 8.0
Improvements of the QGIS plugin

What's new in OTB 8?

OTB 7.4

OTB 8.0

Help Run as Batch Process... Close Run

0%

Parameters Log

Vector Data

/mnt/datas/OTB2/otb/Data/input/waterways.shp

Feature

width

Output XML file

[Save to temporary file]
Improvements of the QGIS plugin

What’s new in OTB 8?

OTB 7.4

OTB 8.0
Let’s test the new release on Wednesday!