

AI@ONERA

1. Domaines couverts
2. Plates-formes matérielles
3. Plates-formes logicielles
4. Comment collaborer avec l'IA@ONERA

Philippe.Bidaud@onera.fr





- Les travaux de recherche en IA@ONERA portent sur plusieurs dimensions du développement de systèmes intelligents et de l'ingénierie des systèmes « assistée par l'IA » du domaine ASD.
- L'IA@ONERA mobilise plus d'une trentaine d'EQTP dans tous les départements (TIS, MFE, PHY, MAS) pour le développement des méthodes et les applications.

« processus de modification des connaissances /comportement au cours des interactions d'un système avec son environnement ».



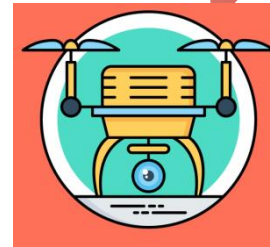
Apprentissage

« liée au raisonnement ainsi qu'aux connaissances sur lesquelles elle s'appuie »



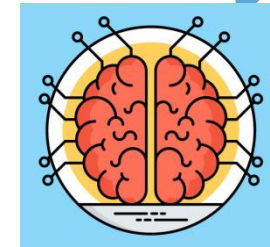
Décision

« fonctions associant perception et action et mettant en œuvre différents schémas d'intégration »



Robotique

« processus qui, d'une manière générale, concerne la perception ou les activités sensori-motrices et la cognition sociale ».



Cognition

PLATES-FORMES

1

Véhicules aériens autonomes



3

Surveillance par systèmes robotiques



4

Apprentissage des aides au pilotage



2

Géo-Intelligence



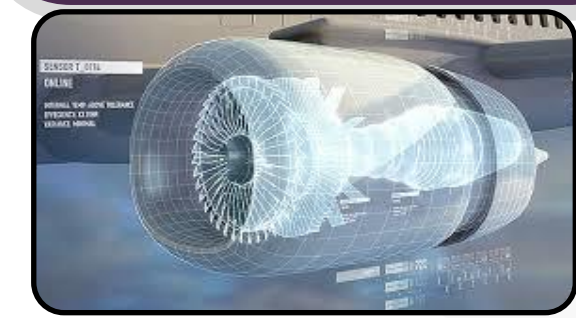
5

Maintenance Digitale MRO 4.0



6

Simulation hybride (Digital Twin)



PLATES-FORMES LOGICIELLES



IA@ONERA
Intelligence artificielle

Quels enjeux pour l'ASD ?
Quels objectifs pour l'ONERA ?

Collaborer à travers des co-encadrements de thèses, des projets collaboratifs, des MAD, des conventions de recherche, des PRI, etc.

ONERA
THE FRENCH AEROSPACE LAB



Apprentissage machine

Architectures pour l'apprentissage supervisé, semi-supervisé, non-supervisé, etc. pour la modélisation-simulation physique, la télédétection, reconnaissance de scènes dynamiques, vision active, navigation,



Modélisation et Décision

Planification d'actions mono et multi-agents, planification distribuée, planification hiérarchique, planification réactive (robuste), aide à la décision



Robotique et Autonomie

Lois de guidage coopératif, évolution sous perturbations, méthodes délibératives, coordination pour l'observation et l'exploration distribuée



Réduction de modèles et Simulation hybride

Réduction de modèles et méta-modèles par apprentissage statistique, simulation multiphysique, synthèse de comportements, ingénierie des systèmes




Synthèse de commande par apprentissage

Modèles d'intégration sensorielle pour l'estimation d'état, apprentissage par renforcement pour l'assistance au pilotage.

DATASETS

Datasets

OSCD - ONERA SATELLITE CHANGE DETECTION



Citation Author(s): Rodrigo Caye Daudt (ONERA), Bertrand Le Saux (ESA/ESRIN), Alexandre Boulch (Valeo.ai), Yann Gousseau (Telecom ParisTech)

Submitted by: Bertrand Le Saux

Last updated: Sat, 06/06/2020 - 12:11

DOI: 10.21227/asqe-7s69

Data Format: GeoTIFFs, PNG

Links: Onera Satellite Change Detection Dataset Webpage

License: Creative Commons Attribution (CC BY)

4 ratings - Please [login](#) to submit your rating.

[ACCESS DATASET](#) [CITE](#) [SHARE/EMBED](#)

ABSTRACT

The Dataset

The Onera Satellite Change Detection dataset addresses the issue of detecting changes between satellite images from different dates. It comprises 24 pairs of multispectral images taken from the Sentinel-2 satellites between 2015 and 2018. Locations are picked all over the world, in Brazil, USA, Europe, Middle-East and Asia. For each location, registered pairs of 13-band multispectral satellite images obtained by the Sentinel-2 satellites are provided. Images vary in spatial resolution between 10m, 20m and 60m. Pixel-level change ground truth is provided for 14 of the image pairs. The annotated changes focus on urban changes, such as new buildings or new roads. These data can be used for training and setting parameters of change detection algorithms.

The Benchmark

The algorithms can be tested in a benchmark for change detection. The ground truth for the 10 remaining images remain undisclosed. Change prediction maps can be uploaded for evaluation on the IEEE GRSS DASE website. Various metrics such as per-class accuracy and confusion matrices are automatically computed on the website, and are available for participants. Comparison to the best performing methods is provided in the leaderboard associated with this benchmark.

(Update June 2020) Alternatively, you can use the test labels which are now provided in a separate archive, and compute standard metrics. For this purpose, we provide you with a python notebook to train, apply and evaluate Fully-Convolutional Networks for change detection: https://github.com/rcdaudt/fully_convolutional_change_detection

References

If you use this work for your projects, please take the time to cite our paper:

Urban Change Detection for Multispectral Earth Observation Using Convolutional Neural Networks, R. Caye Daudt, B. Le Saux, A. Boulch, Y. Gousseau. IEEE International Geoscience and Remote Sensing Symposium (IGARSS2018), Valencia, Spain, July 2018.

[PDF] [BibTeX]

The Team

- Rodrigo Caye Daudt, rodrigo.daudt@onera.fr
- Bertrand Le Saux, bls@ieee.org
- Alexandre Boulch, alexandre.boulch@valeo.ai
- Yann Gousseau, yann.gousseau@telecom-paristech.fr

First LPT and DA challenge

User login

Username *

Password *

Create new account
 Request new password

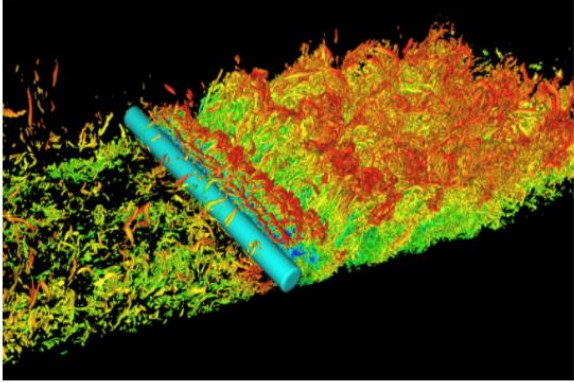
CAPTCHA

This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.

Math question *
1 + 11 =
Solve this simple math problem and enter the result. E.g. for 1+3, enter 4.

First LPT and DA Challenge data portal

This site contains the datasets forming the first challenges on Lagrangian Particle Tracking (LPT) and on Data Assimilation (DA) from LPT data.



Updates June 17th and 22nd + July 10th, 2020: see changes highlighted in green For full updated instructions, please consult file 1st LPT and DA Challenge Instructions_Update_10072020.pdf in the 'Challenge Files' section.

Due to the ongoing Covid-19 sanitary crisis, changes have occurred in the organization of the challenge and related workshop. Please see below the new deadline for upload of processed data, as well as the new date and location for the workshop. Please also consult <http://cdforpriv.dlr.de/> for all important dates. We will continue to monitor the course of events and let participants know in case of further changes.

Please note the following points:

- Datasets can be freely downloaded by everyone, even without participation to the challenge. Please feel free to have a look at them, and at the document providing their description and the instructions to participants! To access to the data, you simply have to create an account on this website. **Account creation is anonymous and only requires a valid e-mail address; accordingly, during results presentation, no mention will be made of the identity of participants who downloaded the data. Only participants whose name was on the challenge files will be mentioned.**

Autres datasets :

- Dataset for Semantic Scene Understanding using LiDAR - Sequences
- Drone detection dataset
- 3D SLAM DataSet, etc.