



# EuroSDR Educational Service 2020

The 18<sup>th</sup> series of EuroSDR e-learning courses will open on 2<sup>nd</sup> and 3<sup>rd</sup> March 2020 with a **pre-course seminar** hosted by IGN France and Ecole Nationale des Sciences Géographiques (ENSG). The seminar will take place at the ENSG premises, Marne-la-Vallée, France. The goal of the seminar is to (i) introduce the topics and content of four e-learning courses; (ii) help to create and strengthen professional networks among the participants, tutors and EuroSDR representatives. The seminar is followed with **four e-learning courses**. Each course requires about **thirty hours of online study** and it is completed over a period of **two weeks** during spring 2020.

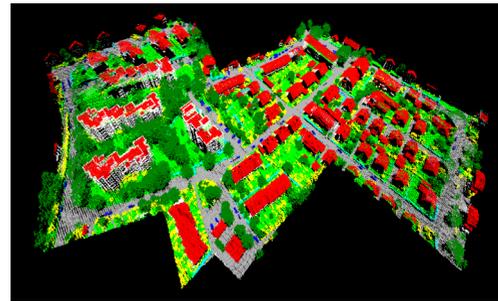


## Deep Learning for Remote Sensing

*Tutors: Loic Landrieu (IGN France), Sébastien Lefèvre (Université Bretagne Sud), Bertrand Le Saux (ONERA)*

Deep Learning has led to significant breakthroughs in various fields including computer vision. Remote sensing also benefits from such methodological advances and deep networks currently achieve state-of-the-art results in many automatic tasks, such as object detection, semantic segmentation (e.g. for land cover mapping), change detection, etc. The goal of this course is to introduce deep learning, review the main architectures able to cope with 2D rasters and 3D points clouds and relevant for cartography, photogrammetry and other EuroSDR-related fields, as well as to train the participants with available software and codes. Participants are informed that a basic knowledge of Python programming language is required, in order to benefit from the experimental work that will be conducted with Pytorch/Tensorflow (for which no prior knowledge is required).

Dates: 9<sup>th</sup>–20<sup>th</sup> March 2020

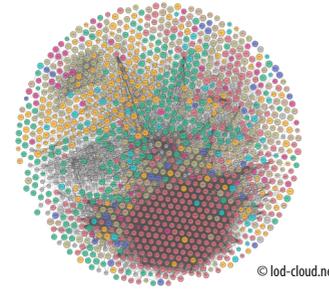


## 3D Sensing, Scene Reconstruction and Semantic Interpretation

*Tutors: Martin Weinmann & Boris Jutzi (Karlsruhe Institute of Technology), Michael Weinmann (University of Bonn), Franz Rottensteiner (Leibniz Universität Hannover)*

The adequate acquisition and analysis of a scene are of great interest for photogrammetry, remote sensing, computer vision and robotics. In the scope of this course, we will address four major issues in this regard. The first part will give a general introduction on geometry acquisition via (passive and active) optical 3D sensing techniques. The second part will focus on active optical 3D sensing as commonly used for the acquisition of large geospatial data and provide a survey on the extraction of descriptive features from such data. The third part will focus on a semantic interpretation of point cloud data and thereby address all components of a typical processing workflow from given point cloud data to a semantic labeling with respect to user-defined classes. The fourth part is dedicated to deep learning techniques for the semantic labeling of point clouds as well as to the context-based classification of these data using graphical models such as Conditional Random Fields (CRFs).

Dates: 30<sup>th</sup> March –10<sup>th</sup> April 2020



## Spatial Linked (Open) Data

*Tutors: Erwin Folmer (Kadaster and University of Twente), Stanislav Ronzhin (ITC, University of Twente, Kadaster), Rob Lemmens (ITC, University of Twente), Wouter Beek (Triply, VU University, Kadaster)*

This is an introductory course to Spatial Linked Open Data. Linked Open Data is a standards based approach for data interoperability. In this course we will teach the basic theory of Linked Data, and introduce the most important standards such as RDF. More in depth the topic of data modelling, vocabularies and ontologies will be elaborated as one of the key concepts of Linked Data. Although the concepts and technology is generic and not specific for spatial data we will discuss in particular the context of spatial data on the web. The second part of this course is split in a technical module and a business module. The business module will discuss the business case for linked data implementations based on the case study of the Dutch Kadaster, one of the earlier linked data implementations in Europe. The technical module will provide best practices how to convert data into linked data, and will be practical hands-on creating SPARQL queries.

Dates: 11<sup>th</sup>–22<sup>th</sup> May 2020



## GeoBIM – Basic Principles and Use Cases

*Tutors: Lars Harrie (Lund University) and Claire Ellul (University College London)*

There is an increasing awareness amongst practitioners in both the geospatial and Architecture Engineering and Construction (AEC) communities that enabling interoperability and moving towards integration of data from the two domains can provide benefits to sectors such as construction, asset management, safety and security, local and regional planning and building permit processes, national mapping agencies and many more. Taking a data-driven perspective on interoperability and integration – i.e. looking at the integration of Building Information Modelling (BIM) and geospatial data - the course will provide a comprehensive overview of GeoBIM, starting from first principles - comparing BIM and Geo, identifying opportunities for using integrated data and challenges arising. Two case studies then give the opportunity to explore the topic more in depth – planning/permits processes and asset/facilities management. The course concludes by allowing students to explore GeoBIM in a wider context, as a location-enabled foundation for digital twins, smart cities and the internet of things. Various examples from practical applications and hands-on practical work will illustrate the theory.

Dates: 1<sup>st</sup> – 12<sup>th</sup> June 2020

**Fees**  
600 € for pre-course seminar + 1 or 2 courses  
700 € for pre-course seminar + 3 or 4 courses  
100 € for pre-course seminar only

For more information visit  
<http://www.eurocdr.net/education/current>

