



# EuroSDR Educational Service 2024

The 22nd series of EuroSDR e-learning courses will begin on **March 4-5, 2024** with an **pre-course seminar**, hosted by the KU Leuven, Public Governance Institute, Leuven, Belgium. During the seminar, background material of four e-learning courses will be presented by the tutors, participants will meet the tutors and fellow participants, and the learning platform – Moodle, will be demonstrated. **The four two-week e-learning courses** are scheduled from **March to June 2024**. Each course requires about thirty hours of online study.



## Remote sensing and change detection with Sentinel time series data

*Tutors: Krištof Oštir, Bujar Fetaj, Matej Račič (University of Ljubljana)*

Copernicus, the EU Earth observation programme, is served by a set of dedicated satellites (the Sentinel families) and contributing missions. Since the launch of Sentinel-1A in 2014, the European Union has set in motion a process to place a constellation of almost 20 more satellites in orbit before 2030. The course covers several aspects of processing dense time series data provided by the Sentinel satellites. The focus will be on high-resolution radar (Sentinel-1) and optical (Sentinel-2) data. The first step is to get data, both by classic download via Copernicus Open Access Hub and via Sentinel Hub. The basic processing is done with the open-source programme SNAP and the individual Sentinel Toolboxes. Afterwards, participants will learn how to process time series using Jupyter Notebooks and the Sentinel Hub Statistical API. They query the data, get and store time series as images and data frames (tables), and perform simple machine learning classification.

**Dates: March 11-22, 2024**



## Sustainable Business Models for Open Geospatial Data

*Tutors: Joep Crompvoets (KU Leuven), Frédéric Cantat (Institut national de l'information géographique et forestière - IGN)*

In the EU Open data directive geospatial and earth observation data are labelled as High Value. As National Mapping and Cadastre Agencies (NMCAs) in Europe are key providers of these types of data and as there is no such thing as a free lunch, NMCAs are enforced to provide geospatial for free but at a cost for themselves.

The course on sustainable business models for open geospatial data will identify and analyse relevant business models that provide open geospatial and earth observation data in a sustainable way. It is the intention that course participants build a sustainable open (geospatial/earth observation) data business model for their organization or an imaginary one.

**Dates: April 8-19, 2024**

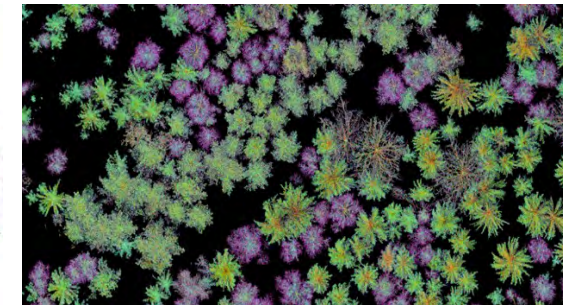


## From traditional to AI-based 3D scene capture and modelling

*Tutors: Michael Weinmann (Delft University of Technology), Dennis Haitz and Martin Weinmann (Karlsruhe Institute of Technology)*

Deep Learning has led to significant breakthroughs in various fields. The advent of implicit, neural-network-based scene representations, e.g., Neural Radiance Fields (NeRFs) marks a significant leap in photogrammetric computer vision and novel view synthesis, and respective applications in robotics, urban mapping, autonomous navigation, virtual/augmented reality, etc. Employing neural networks to encode high-resolution scene information has been demonstrated for precise 3D models while being more compact than scene representations in terms of point clouds or voxel block models. Through a blend of theoretical insights, visual illustrations and practical exercises, this course will delve into core concepts, implementation strategies, advanced applications of traditional and neural-network-based 3D scene capture and visualisation, providing you with the skills and knowledge to reflect on the strengths, innovation potential and limitations of current approaches.

**Dates: May 6-17, 2024**



## Point cloud processing with laser scanning

*Tutors: Juha Hyyppä, Joseph Taher, Matti Lehtomäki (Finnish Geospatial Research Institute, Finland)*

The development of point cloud generation optoelectronics has been fast in the last decades. The first Airborne Laser Scanners (ALS) were from the early 1990s, followed by Mobile Laser Scanners (MLS) from the early 2000s. Autonomous cars use similar lidar technology for autonomous perception. Previously, Google Tango and, today, iPad Pro include a laser scanner allowing crowdsourced applications. There are also hand-held, backpack and drone systems, including lidars. Terrestrial laser scanning has become a standard tool for providing 3D data in non-built and built environments. This course will provide an understanding of how such point clouds could be processed into informatics. Introduction is given to laser scanning physics, general point cloud processing techniques, and then more focus is given to AI, namely machine-learning and deep-learning approaches in point cloud processing. Several applications are covered, in particular from forestry.

**Dates: June 3-14, 2024**

**Fees** 400 € for pre-course seminar + 1 or 2 courses | 500 € for pre-course seminar + 3 or 4 courses  
5 grants for PhD/MSc students covering admission fee are available (see the application form on the EduServ website).

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

