



EuroSDR Educational Service 2025

The 23rd series of EuroSDR e-learning courses will begin on **March 3-4, 2025** with a **pre-course seminar**, hosted by the National Land Survey of Finland, Finnish Geospatial Research Institute FGI, Espoo, Finland. 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 2025**. Each course requires about thirty hours of online study.

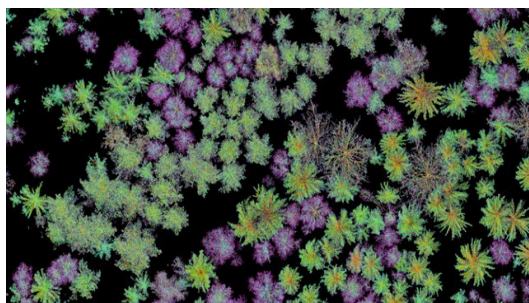


From Traditional to AI-based 3D Scene Capture and Modeling

Michael Weinmann (Delft University of Technology), Dennis Haitz, Martin Weinmann (Karlsruhe Institute of Technology)

Artificial Intelligence (AI) has led to significant breakthroughs in various fields. The advent of implicit, neural-network-based scene representations marks a significant leap in photogrammetric computer vision and novel view synthesis as well as respective applications in robotics, urban mapping, autonomous navigation, virtual/augmented reality, etc. Employing neural networks to encode high-resolution scene information has been demonstrated to capture precise 3D models, while additionally 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, and advanced applications of traditional and AI-based 3D scene capture and visualization, providing you with the skills and knowledge to reflect on the strengths, innovation potential and limitations of current approaches.

Dates: March 17-28, 2025



Point Cloud Processing with Laser Scanning

Juha Hyyppä, Josef Taher and Matti Lehtomäki (Finnish Geospatial Research Institute)

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 and 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: April 7-18, 2025

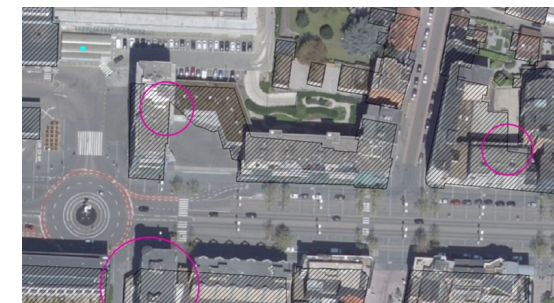


Machine Learning for Earth Observation

Hao Cheng, John Ray (JR) Bergado and Claudio Persello (ITC, University of Twente)

In recent decades, Machine Learning (ML), particularly Deep Learning (DL), has achieved tremendous success across various domains. This course will begin with a general overview of ML, followed by an exploration of key DL applications in Earth Observation and Geoscience, such as semantic segmentation and change detection using aerial imagery. Step-by-step practical exercises will be provided using Python notebooks. The course is structured into four modules: (i) introduction to ML covering conventional classification methods such as Support Vector Machines (SVM) and Random Forest (RF), illustrated by land cover mapping; (ii) DL with an emphasis on Convolutional Neural Networks (CNNs), illustrated by CNN-based image classification model; (iii) advanced image analysis, including semantic segmentation, object detection, instance segmentation, panoptic segmentation, and polygonization; (iv) change detection with the application of neural networks for detecting changes over time.

Dates: May 5-16, 2025



Spatial Data Quality

Joep Cromptvoets (KU Leuven), Anouk Huisman-van Zijp (Kadaster), Antonello Rizzo Naudi (Planning Authority), Anka Lisec (UNI Ljubljana)

The geospatial landscape has experienced significant transformation, with the volume of geolocated data expanding. Key aspects like accuracy, completeness, and consistency are critical in minimising errors and maximising the value of spatial data across various applications. For national mapping and cadastral agencies, maintaining high standards of spatial data quality is crucial for ensuring the dependability of the information used. To gain better insights in spatial data quality, EuroGeographics Quality KEN and EuroSDR organise a course that is dedicated to this topic. We will explore different data quality elements and methods, look into visualisation challenges, and explore innovative technologies to determine spatial data quality. The course has four modules: (i) Basics of spatial data quality management; (ii) Spatial data quality management; (iii) Quality assurance and evaluation, including measures, methods, and trust; (iv) Visualisation of quality and crowdsourcing.

Dates: June 2-13, 2025

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.eurosdnet/education/current>

