HYPERedu

A new online learning platform for hyperspectral remote sensing

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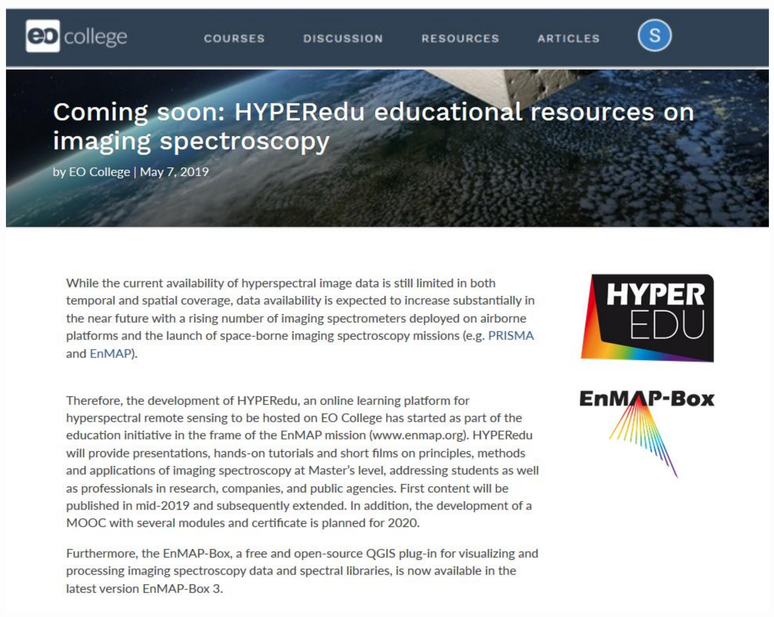
Background

Hyperspectral imagers have been demonstrated to be a source of accurate and quantitative information about terrestrial and aquatic ecosystems required in various application fields. While the current availability of hyperspectral image data is still limited in both temporal and spatial coverage, data availability is expected to increase substantially in the near future with a rising number of imaging spectrometers deployed on airborne platforms and the launch of space-borne imaging spectroscopy missions (e.g. PRISMA and EnMAP). In view of these developments, an increasing need for Earth Observation education and training activities with a focus on hyperspectral imagery is expected in the next few years.

Objectives

Therefore, the development of HYPERedu, an online learning platform for hyperspectral remote sensing to be hosted on EO College has started as part of the education initiative within the EnMAP mission (www.enmap.org). HYPERedu will provide presentations, hands-on tutorials and short films on principles, methods and applications of imaging spectroscopy at Master's level, addressing students as well as professionals in research, companies, and public agencies. First content will be published in mid 2019 and subsequently extended. In addition, the development of a first Massive Open Online Course (MOOC) with several modules and certificate is planned for 2020.

Hosting and Content



EO College website hosting HYPERedu

Contents:	Annotated slide collections, hands-on tutorials and educational films on principles, methods and applications of imaging spectroscopy; Development of a MOOC with several modules and certificate
Target group:	Students and professionals at Master's level (English language)
Hosting:	EO College online learning platform (eo-college.org)
Licence:	All content is provided free of charge and under a Creative Commons Attribution-ShareAlike 4.0 International License

Examples of first tutorials

Examples of first (annotated) slides

Envisioned content of the HYPERedu online learning platform (may be further extended in the future)

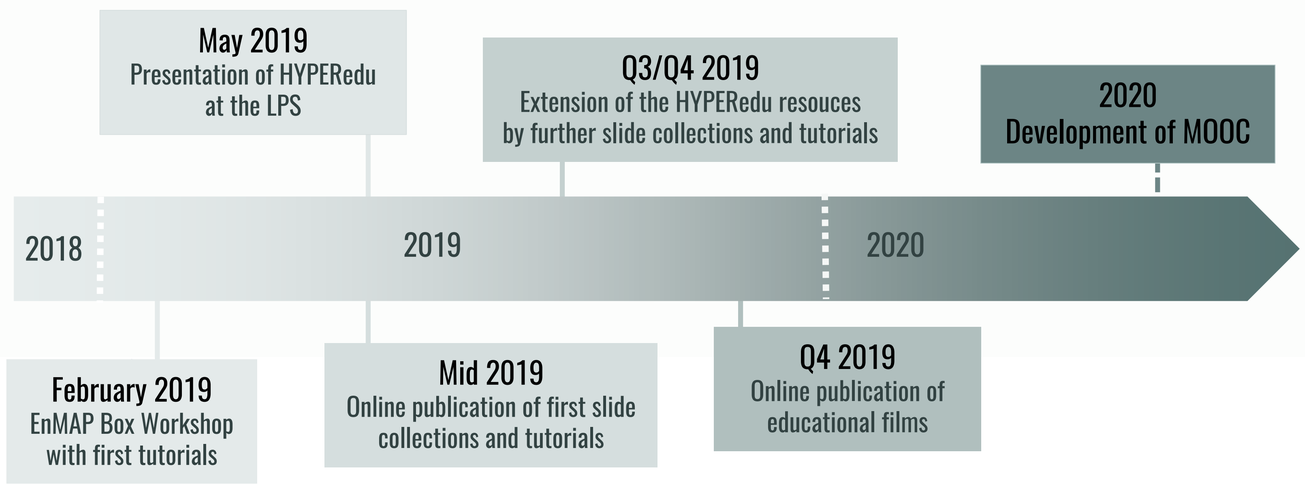
Basics
- Principles of imaging spectroscopy
- Principles of sensor technology & data acquisition
- Data preprocessing
  - Preprocessing
  - Sensor simulation

Methods
- Classification methods
- Quantification methods
- Radiative transfer models

Applications
- Vegetation
  - Forests
  - Agricultural areas
  - Natural ecosystems and gradients
- Soils
- Geology
- Urban areas
- Water
- Atmosphere and gases
- Ice and snow

Software and data
- Data sources (lab, field and imaging spectroscopy)
- EnMAP Box introduction

Time schedule of the HYPERedu development



EnMAP-Box software

Also developed under the EnMAP science program:
The **EnMAP-Box**, a free and open-source plug-in for QGIS for visualizing and processing imaging spectroscopy data and spectral libraries, is **now available** in the latest version EnMAP-Box 3 from https://enmap-box.readthedocs.io.

Also present at ESA LPS 2019, Session C7.01 Board 356
Okujeni et al.: The EnMAP-Box 3 – a free and open-source toolbox for imaging spectroscopy data processing

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