OPTI ISE workshop

PROGRAM BOOK

Combined WG1 and WG3 workshop on sampling, data processing and retrieval of biophysical parameters from field and airborne hyperspectral data of vegetation

26, 29 and 30 September 2016, Enschede, The Netherlands

Contents

Program Monday, September 26

Location: ITC building, Hengelosestraat 99, room 5-108

Time schedule:

8:30	Room opens
9:00 - 10:30	*Introduction sessions on data, modelling and retrieval*
10:30-11:00	Coffee break
11:00-12:30	*First practical session*
12:30-13:30	Lunch break
13:30-15:00	*Second practical session*
15:00-15:30	Coffee break
15:30-17:00	*Third practical session*

The overall objective is to develop skills to acquire, store and use hysperspectral data for retrieval of biophysical parameters. We will provide training in the independent use of the following packages:

- *SPECCHIO*
- *SCOPE*
- *ARTMO*

Format:

3 x 30-minute introductions to each software package

Breakout sessions with hands-on in a software package of choice (three sessions in which different topics will be covered).

The sessions deal with:

(1) SPECCHIO (led by Andy Hueni),

(2) Retrievals with ARTMO (led by Jochem Verrelst). Topics include: (a) operating ARTMO, (b) machine learning, (c) using emulators, (d) global sensitivity analysis.

(3) SCOPE modelling (led by Wout Verhoef and Christiaan van der Tol). This topics include: (a) running a leaf level model and the full SCOPE model, (b) retrieving parameters from leaf spectra, (c) retrieving data from field data at the canopy scale, and from airborne data (HyPlant).

Groups rotate during the day; parallel sessions will be held in three different rooms with smaller groups.

Program 29 and 30 September 2016

Workshop objectives:

To develop protocols and terminology for hyperspectral remote sensing of vegetation:

- *Sampling*
- *Retrieval algorithms for biophysical parameters from for field, airborne and satellite hyperspectral remote sensing data of reflectance, transmittance and fluorescence*
- *Quality flags of higher level products*

Format:

- *10-minute presentation of a key experts in each field*
- *Topics discussed in small groups*
- *(Pseudo) coding and computations with real data from SWAMP and ABEL/ Specchio.*
- *Plenary presentation and discussion*

Output:

Peer-review manuscript – suggested topics:

Group 1 – Definition of the technical requirements and acquisition protocols for reflectance and fluorescence measurements from ground-based instruments.

Group 2 – SCOPE and ARTMO: from reflectance & fluorescence measurements to vegetation biophysical parameters – Which field measurements are needed?

Group 3 - Definition of the technical requirements and acquisition protocols for reflectance and fluorescence measurements from UAV-based instruments.

Scientific manuscripts with the SWAMP summer school data.

Time schedule

Time	September 29th	September 30th
9:00 – 9:15	*General introduction*	*General introduction*
9:15 – 12:00	Groups introduction SWAMP summer school data introduction	Group work
12:00 – 14:00	*Lunch*	*Lunch*
14:00 – 15:30	Group work	Group work
15:30 – 16:00	*Coffee break*	*Coffee break*
16:00 – 18:00	Plenary meeting: discussing results day1	Plenary meeting: discussing results day2
18:00 – 19:00	*Group coordinators meeting*	*Adjourn or (optional) dinner*
19:00 – 22:00	Dinner at Bistro Het Koetshuis	

Group 1: Measurement products and fluorescence retrieval algorithms

Group leader: Tommaso Julitta

Suggested discussion topics:

Formulate protocols for measurements (from leaf to canopy)

State of the art of the different retrievals methods

Reliability of the retrieved products

Application to UAV and HyPlant data

Group 2: Links between retrieved products and biochemistry

Group leaders: Christiaan van der Tol and Anatoly Gitelson

Suggested discussion topics:

Session 1

Come up with clear definitions of parameters and variables (incl aPAR, yield, LUE, foliar and stand pigment content, relation of these with 'traits' such as SLA, etc.).

The dependence of top-of-canopy reflectance , fluorescence, and photosynthesis on canopy structure (stems, brown material, leaf area and heterogeneity in horizontal and vertical direction).

The dependence of leaf fluorescence on leaf pigments and photochemistry, leaf nitrogen and stress.

Session 2

Which field measurements are required as input for SCOPE?

Which field measurements are required for verification and validation of parts of SCOPE?

What is the best sampling strategy to obtain these data (representativeness and accuracy of the measurements)?

What model functionality is desired by experimental people, and for what purpose?

Session 3

Which alternatives do we have for retrieval algorithms of relevant state variables and parameters (LUT, numerical, two steps, all at once)?

Possible higher level products for field, airborne and satellite hyperspectral remote sensing data (reflectance, transmittance and fluorescence) of vegetation functioning.

Optional extra topics:

How large is the discrepancy between simulated and measured spectra of different leaves (in other words: which part of the spectrum is still 'unexplained' by current models)?

What does the residual spectrum after fitting data to the model tell us?

Group 3 - Scaling Up reflectance and fluorescence measurements (Bottom-Up approach)

Group leader: Helge Aasen

Suggested discussion topics:

Quantifying factors that affect the relationship between leaf and canopy spectra

From FluoWat (leaf) measurements to TOC: scaling with different techniques

Spatial heterogeneity in the SWAMP dataset

Spectral changes due to spatial aggregation

Techniques to 'map' EC fluxes to the footprint

Reproducing FLEX and Sentinel 2 from UAV and field

Logistic information

Venue of the workshop

Faculty ITC, University of Twente, room 5-108

Hengelosestraat 99

7514 AE Enschede

After entering the building, follow signs to OPTIMISE workshop. The workshop is on the 5th floor of the building.

The ITC building is open from Monday to Friday, 7:30-19:00

Contact information

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Internet

ITC has Eduroam. Alternatively, WIFI codes will be provided with your batch on arrival.

Parking

Parking is possible behind the ITC building. Press the button next to the ramp to call the receptionist, and mention into the microphone that you are coming for OPTIMISE. Free parking is also possible at a distance of a few hundred meters from ITC, outside the city ring. Paid parking options can be found at http://cityofenschede.com/aboutenschede/accessibility/parking/

Tip: the P&R parking place + bus at the Zuiderval close by the exit 25 'Enschede-Zuid' of the A35 (Hengelo-Gronau).

Public transport in Enschede

The city centre of Enschede is rather small. Should you need public transportation, you can find info on: ov9292.nl (all public transport in The Netherlands), ns.nl (trains in The Netherlands), db.de (trains in Europe). Local and regional busses and taxis leave from the railway station. To order a taxi: 053-4615060 (DiTaxi).

Bicycles can be borrowed (return on the same day) at the reception of ITC

Lunch and dinner

Lunch will be served on 26, 29 and 30 September in the Annex of the ITC restaurant on the ground floor (at the back of the restaurant), and is included for participants. The dinner on Thursday 29 September will be served at 19:00 at the Koetshuis (see address above). Table water and two drinks are included, more drinks are at own expense.

Dinner will be held at

Bistro Het Koetshuis

Hengelosestraat 111, 7514 AE Enschede

Tel: +31534318456

50 m Northwest of the ITC building

Hotel information

Option 1. Intercity hotel

Rooms have been reserved with a rate of 92.92 Euros per night (single occupancy) including breakfast at the InterCity hotel for the SAIL35 symposium, which can also be used for the workshop participants. Use the following link for reservation:

http://sail35.org/wp-content/uploads/2016/05/reserveringsformulier-Sail-35.pdf

Use this form will stay valid until 29 August 2016.

Willem Wilminkplein 5, 7511 PG Enschede (East side of the railway station)

Tel.: +31 53 2070000

Fax: +31 53 2070001

e-mail: enschede@intercityhotel.com

Option 2. ITC hotel

This is the hotel for ITC students and guests. The fee is 59.25 Euro's per night, including breakfast. Reservations can be made by a short e-mail to: hotel-itc@utwente.nl

website: https://www.itc.nl/itc-international-hotel

address: Boulevard 1945 4, 7511 AE Enschede

telephone: +31 534803999

Travel information

By air and train

Via Schiphol Airport Amsterdam

Direct trains to Enschede leave at 37 minutes into every hour from Schiphol Airport in Amsterdam from platform 1 or 2. Connections with a transfer in Amersfoort leave at 7 minutes into every hour, also from platform 1 or 2. The travel time in both cases is 2:08 hrs. A 2nd class single ticket costs 24.30 Euro (www.ns.nl/en).

Via Düsseldorf Airport

At 13 minutes into every hour, take the train in direction Münster, change in Dülmen to the train to Enschede. Travel time is 2:37 minutes.

At 28 minutes into every hour, take the train in the direction Paderborn, change in Dortmund to the train in the direction Hannover, and change in Münster to the train to Enschede. Travel time is 2:52 minutes.

The cost for a 2nd class single ticket is about 33-41 Euros.

By car

From the West: Follow the A1 to Hengelo, then the A35 in the direction Enschede, take exit Enschede-West and follow road signs to the railway station.

From the South-East: On the A31 from Duisburg to Emden, take exit Gronau, follow road signs to Enschede railway station.

From the Northeast: Follow the E30 (A1 in NL) Osnabrueck-Amsterdam, take exit 'Oldenzaal Zuid', follow directions Enschede station.

Check www.itc.nl for a larger map and detailed directions https://www.itc.nl/Pub/organisation/Contact-information/Maps-and-Directions.html