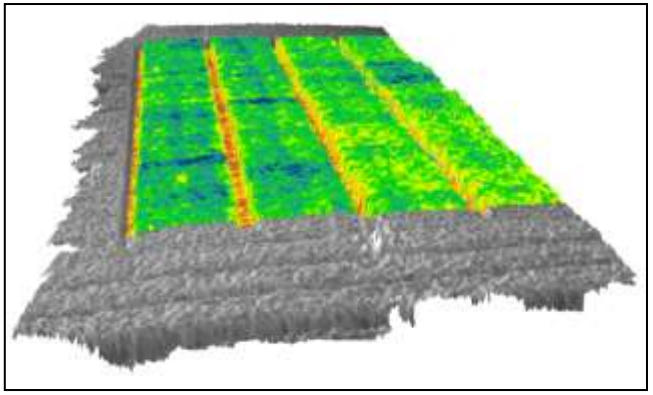
OPTIMISE

Innovative Optical Tools For Proximal Sensing Of Ecophysiological Processes



The state-of-the-art of UAV remote sensing survey

Helge Aasen[1], OPTIMISE community and others[2]

[1] Crop Science Lab, Institute of Agricultural Sciences, Federal Institute of Technology Zürich (ETHZ), Switzerland

[2] Innovative OPTIcal tools for proxiMal sensIng of ecophysiological procesSEs (OPTIMISE), http://optimise.dcs.aber.ac.uk/

COST is supported by the EU Framework Programme Horizon 2020

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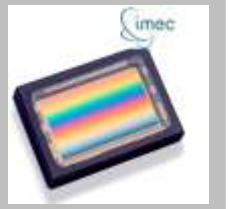
Spectral sensors (<1.2 kg) for UAS RS

TetraCam mini-mca
Multispectral 2D imager
(Berni et al., 2009)
(Kelcey and Lucieer, 2012)

Cubert UHD 185
2D Hyperspectral snapshot imager
(Aasen et al., 2015)



Imec filter-on-chip
Hyperspectral snapshot 2D

2009 2012 2013 2014 2015 2016

Headwall micro-HyperSpec
Hyperspectral line-scanner
(Zarco-Tejada et al., 2012)
(Lucieer et al., 2014)

Rikola FPI – VNIR
2D Hyperspectral sequential imager
(Honkavaara et al., 2013)

Rikola FPI – NIR/SWIR (1100 – 1600 nm)
2D Hyperspectral sequential 2D imager
(Honkavaara et al., 2016)

OceanOptics STS
Hyperspectral points-pectrometer
(Burkart et al., 2014, 2015)

Parrot Sequoia
Mutli-spectral 2D imager

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From particle to pixel

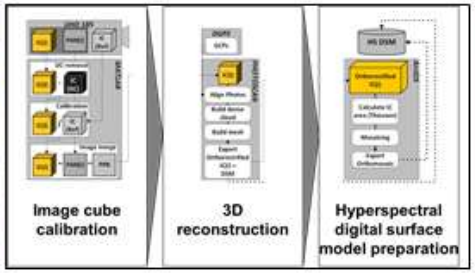
particle in environment

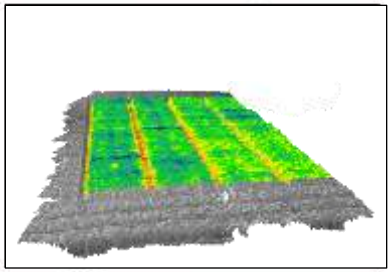
sensor, measurement protocol

data processing

‘pixel’ in digital representation

field

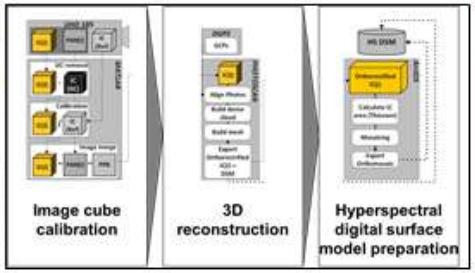
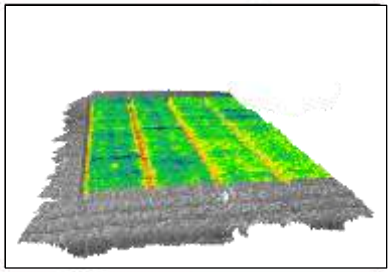




data product

(Aasen, 2016)

From particle to pixel

	particle in environment	sensor, measurement protocol	data processing	‘pixel’ in digital representation	
field					data product

(Aasen, 2016)

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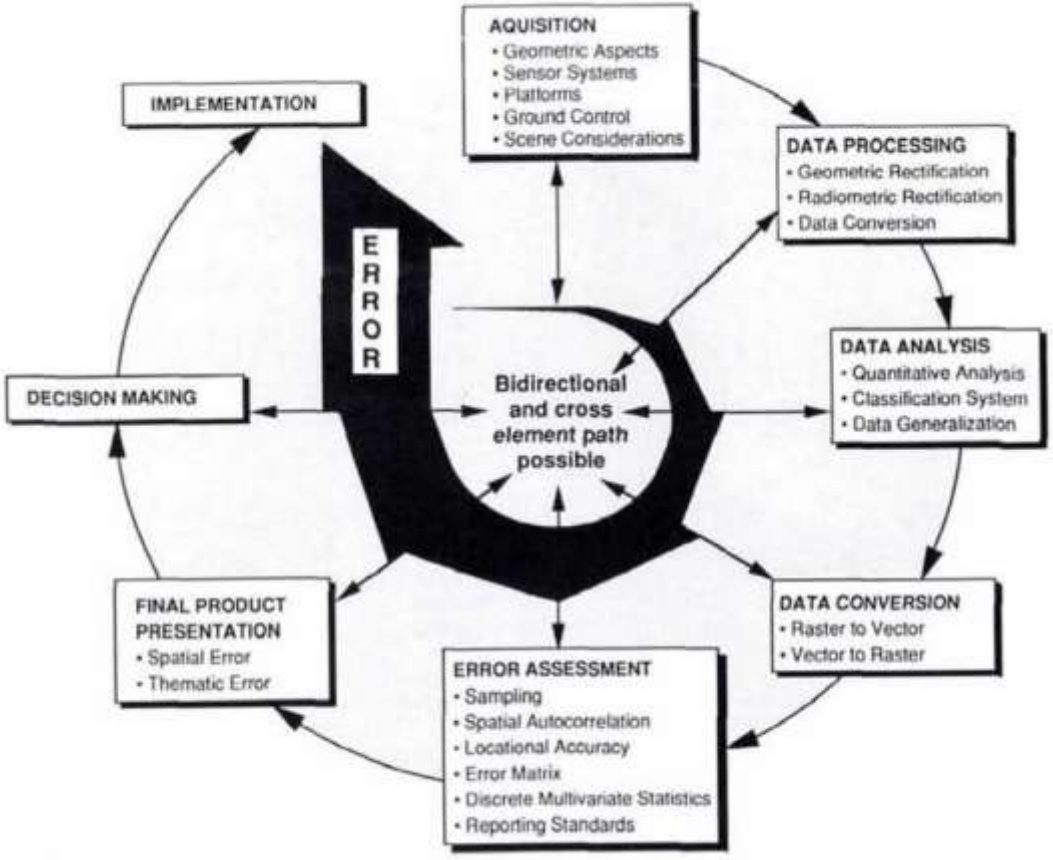
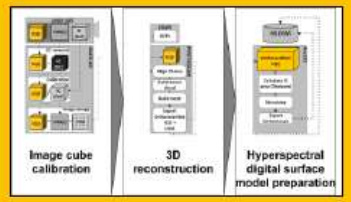
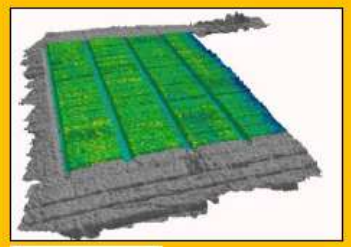
Complexity of the (spectral) remote sensing process



The accumulation of error in a "typical" remote sensing information processing flow (Lunetta et al., 1991)

State-of-the-art in UAV remote sensing





http://optimise.dcs.aber.ac.uk/uav-survey/

A community driven effort to assess the state-of-the-art in remote sensing with UAVs

COST is supported by the EU Framework Programme Horizon 2020

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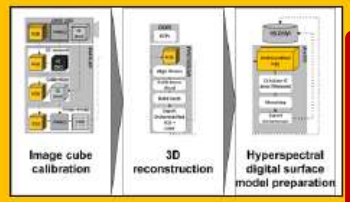
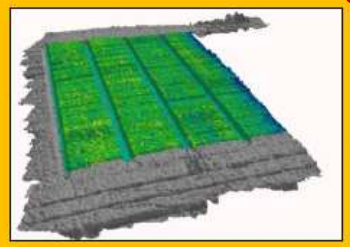
The way in which geospatial data is acquired has transformed tremendously in the last decade. With the rise of UAVs as sensing platforms in combination with lightweight and small sensors, flexible sensing systems have become available for a wide audience.

Within the cost action OPTIMISE (http://optimise.dcs.aber.ac.uk/) we explore the opportunities of UAVs to capture spectral data for ecological and physiological questions at multiple scales. One major effort is to establish best practice procedures for UAV spectral sampling (BUS).



To assess the **state-of-the-art in UAV remote sensing**, we have designed a survey to ask you about your opinion and/or experiences on this topic to identify future needs of the community.

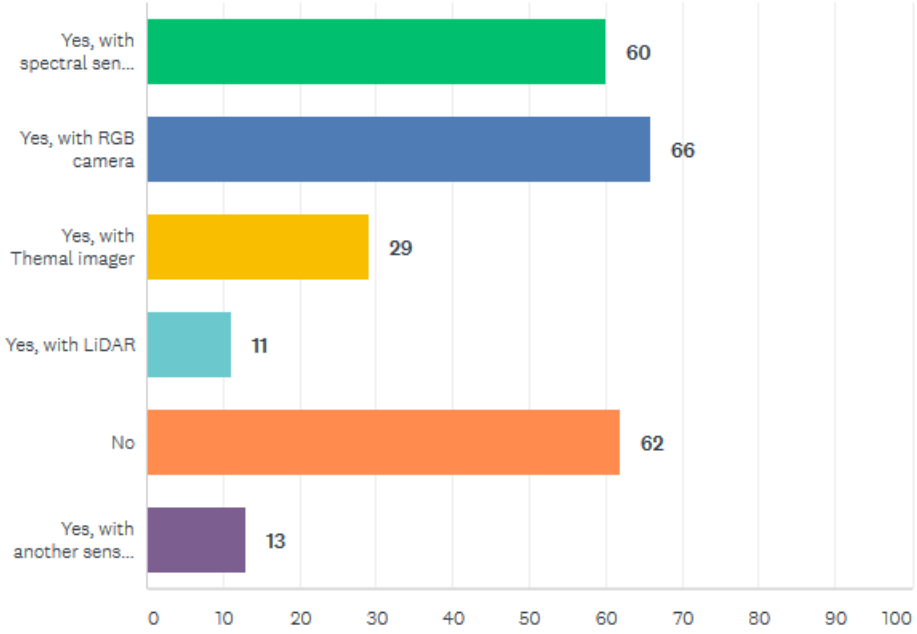


Thus, we kindly ask you to participate in the **OPTIMISE-BUS online survey**. It will take you about **10 - 15 minutes**.

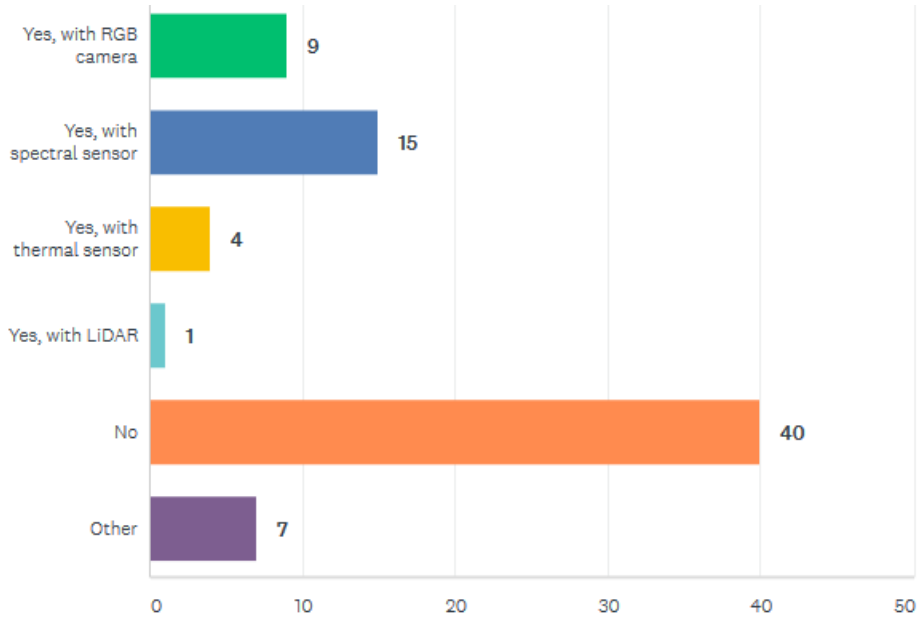
Thank you very much for your support of this initiative and kind regards,
Helge,
on behalf of the OPTIMISE BUS team

For further information please visit the OPTIMSE website (http://optimise.dcs.aber.ac.uk/) or get in touch at helge.aasen@usys.ethz.ch

- 155 people have participated in the survey (Mid July 2017).
- Do you have your own sensing system (sensor and UAV)? And if yes, what sensors do you deploy on it (multiple answers possible)?



- Are you planning to acquire a UAV in the near future?



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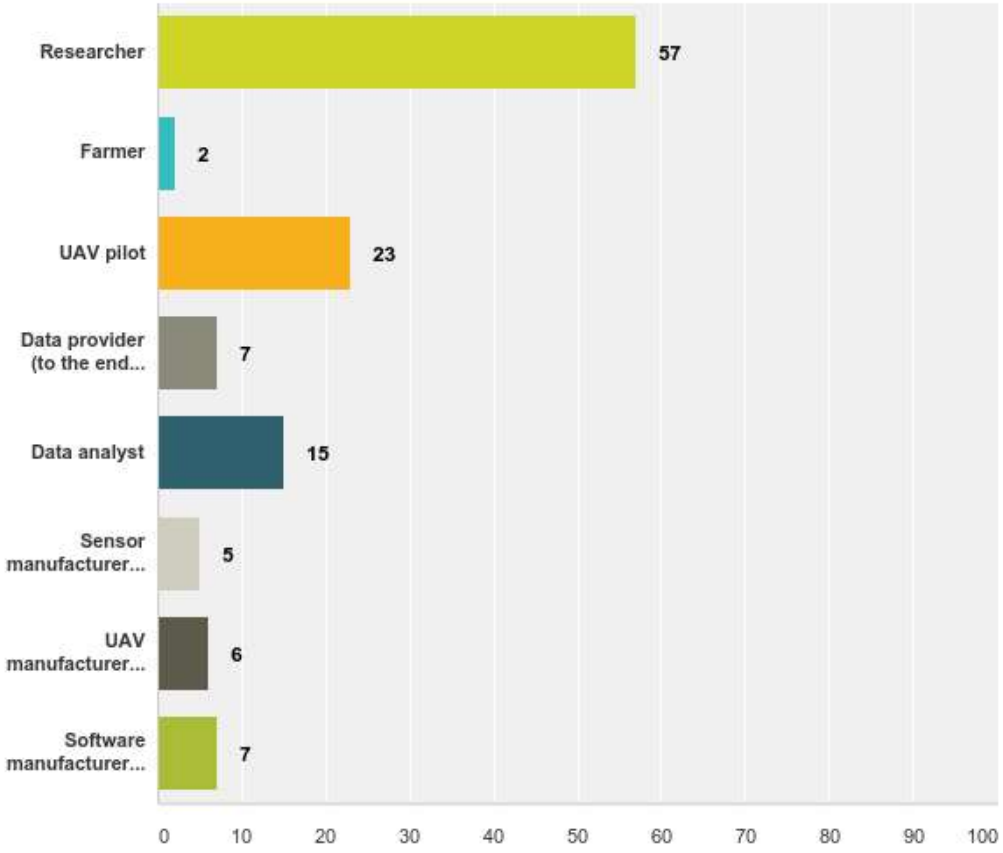
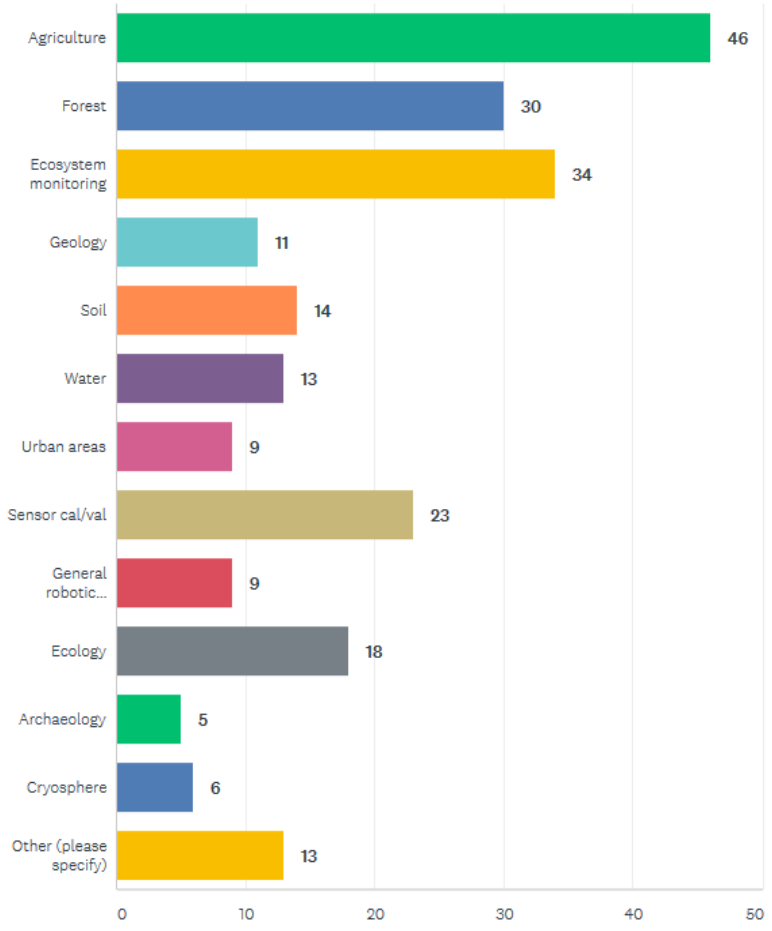
- Current occupation of those who have an own UAV sensing system (multiple answers possible).



- Fields of application of UAV sensing systems (multiple answers possible).



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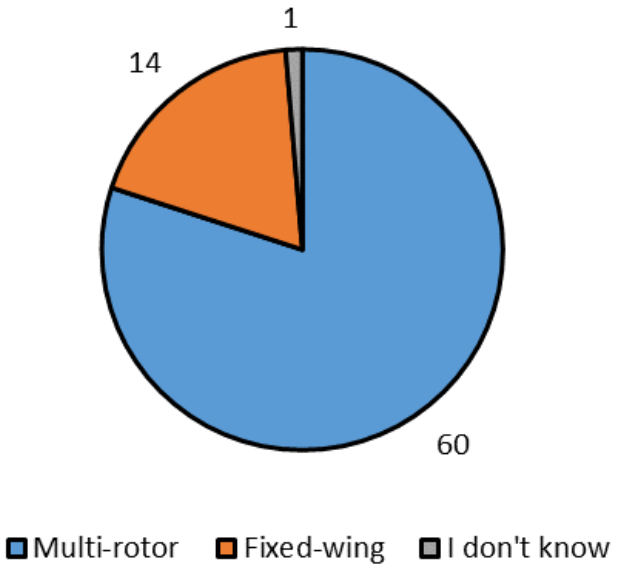
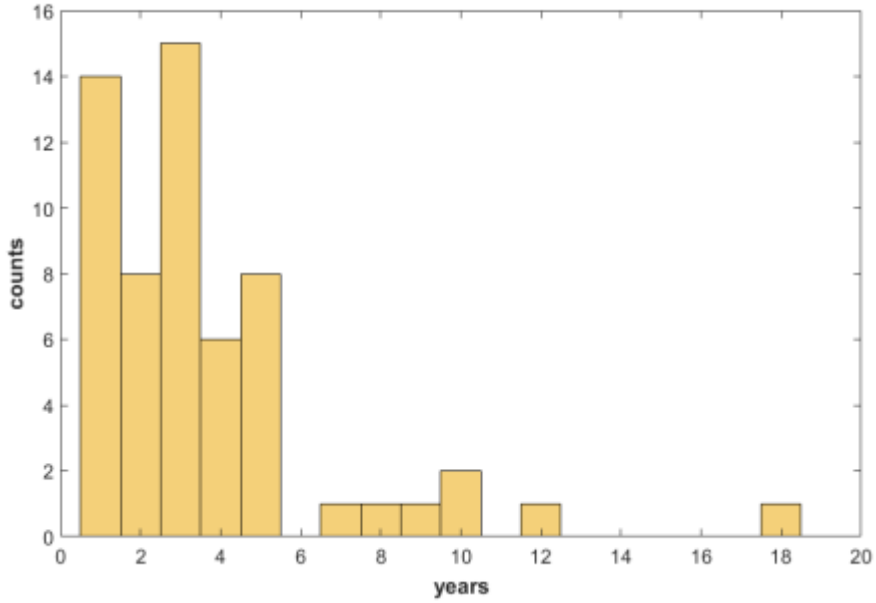
- Used types of UAV platform



- Experience in UAV operation in number of years



OPTIMISE

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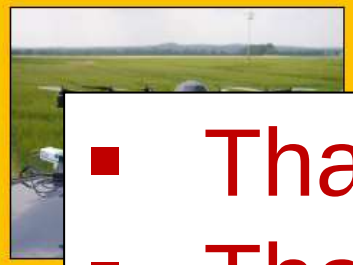
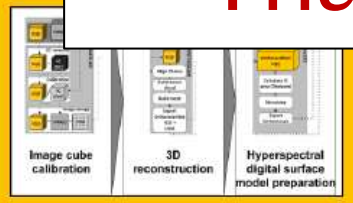
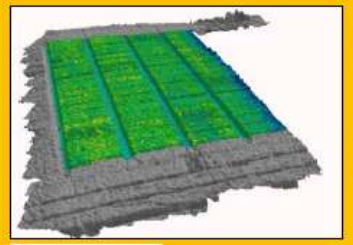
State-of-the-art in UAV remote sensing







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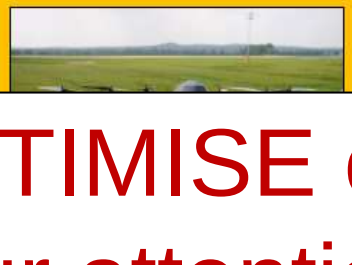

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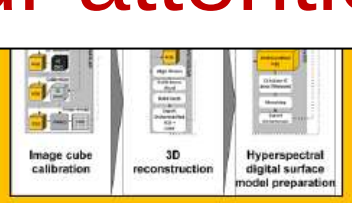
- Thanks to the OPTIMISE community
- Thank you for your attention



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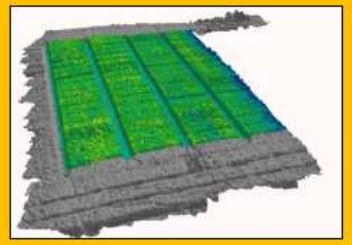

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Literature

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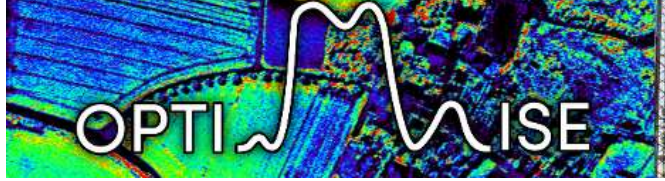

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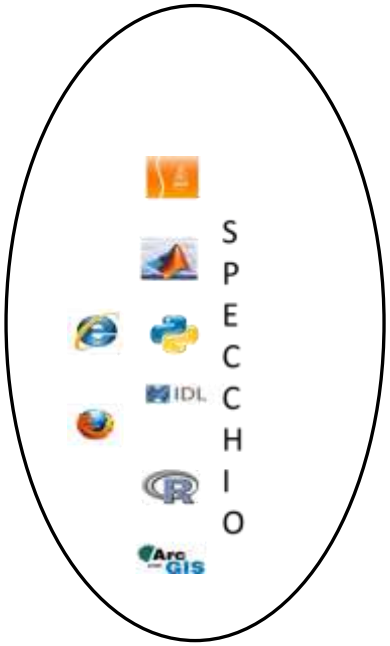
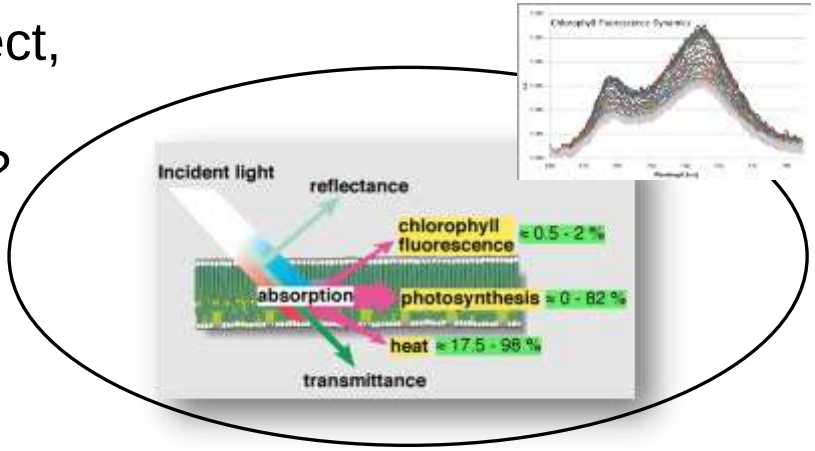
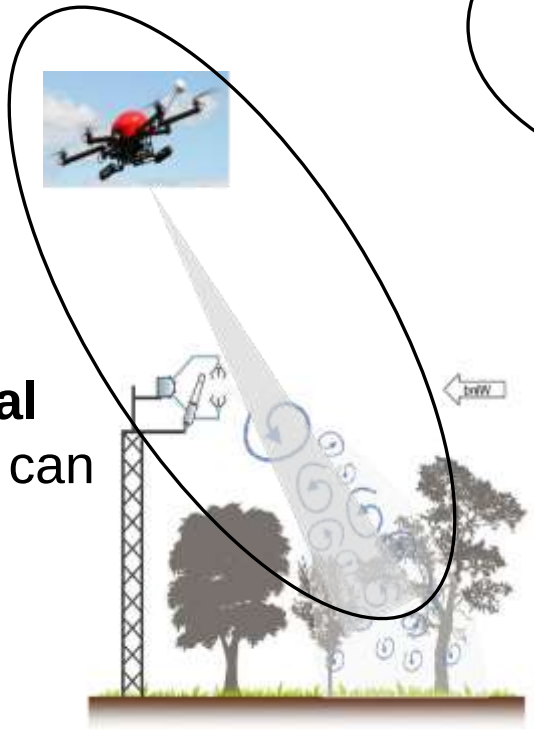


WP1. Spectral Information Systems. How to best collect, process, store, share and acknowledge spectral data?





WP2. Unmanned Aerial Vehicles (UAVs). How can we
tap their potential in ecosystem research?

WP3. Fluorescence and Reflectance. Best-practices for proximal sensing of fluorescence and reflectance and its interpretation.

Helge Aasen | 5/14/2018 | 11
Helge.Aasen@usys.ethz.ch