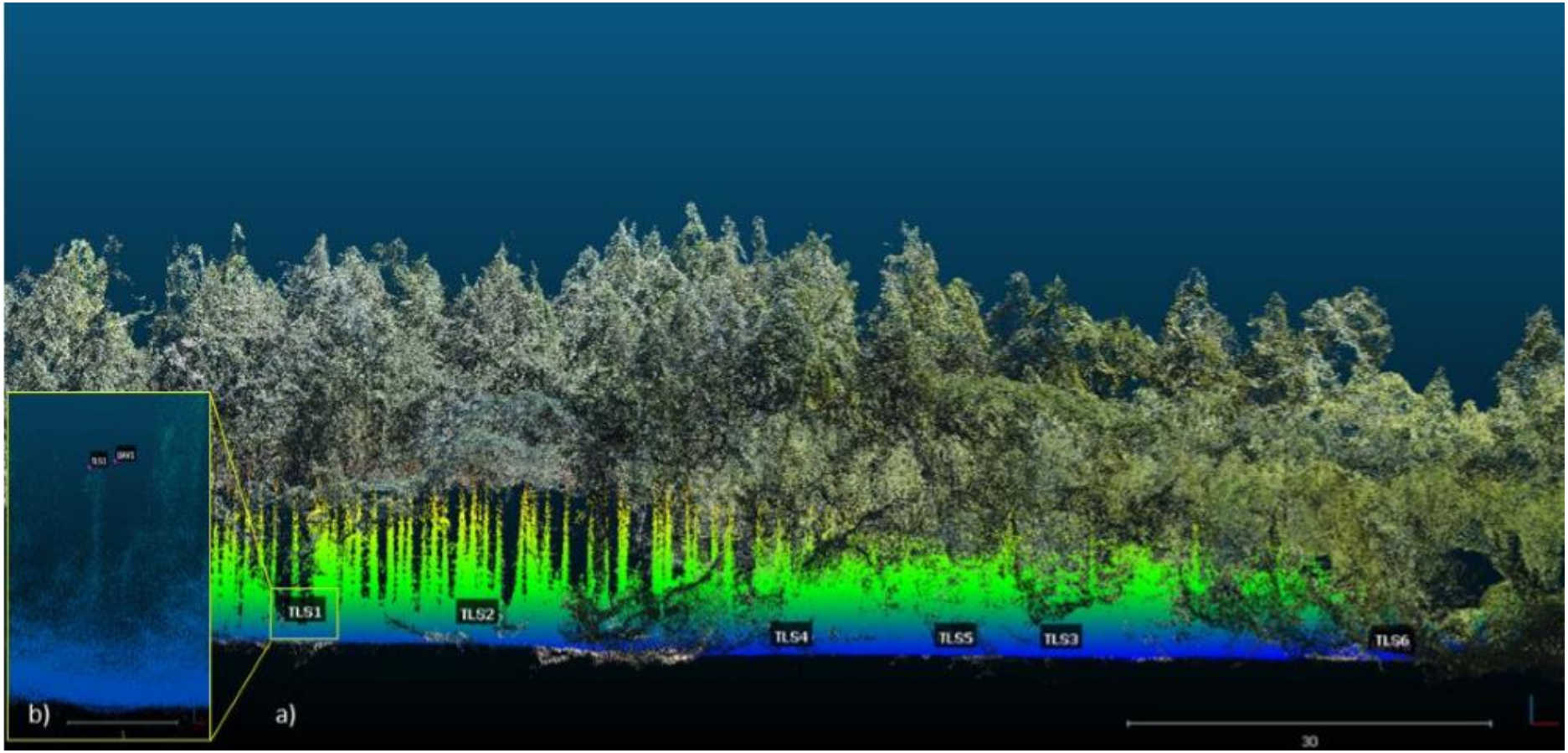
De toekomst van bosinventarisatie



Ing. Nico Spliethof

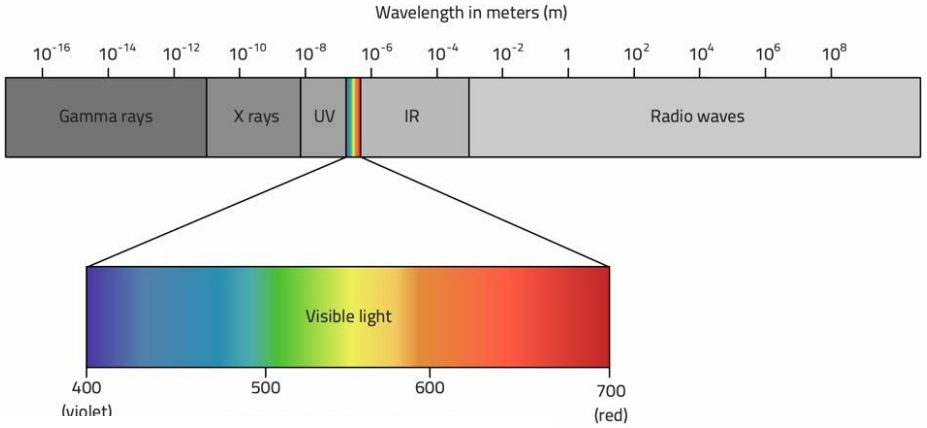
Ir. David Borgman

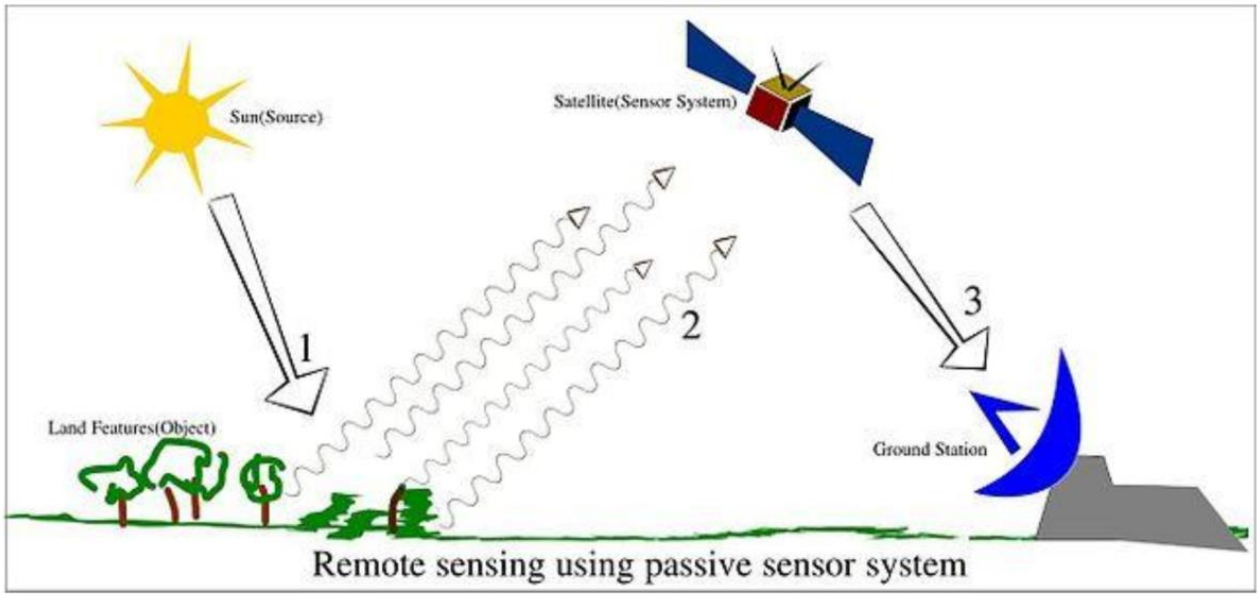
De toekomst van bosinventarisatie

1. Inleiding
2. Remote Sensing / Lichtspectrum
3. Laserscanning / LiDAR
4. Machine Learning, Deep Learning en Neural Networks
5. Foto / Video apps
6. Uitdagingen
7. Blik vooruit
8. Vragen / discussie

Het lichtspectrum en remote sensing

- Actief of Passief
  - Elektromagnetische straling
  - Delen uit het lichtspectrum

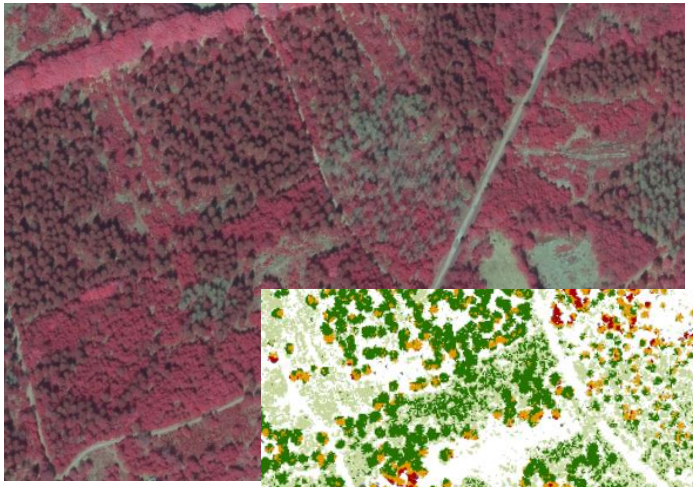


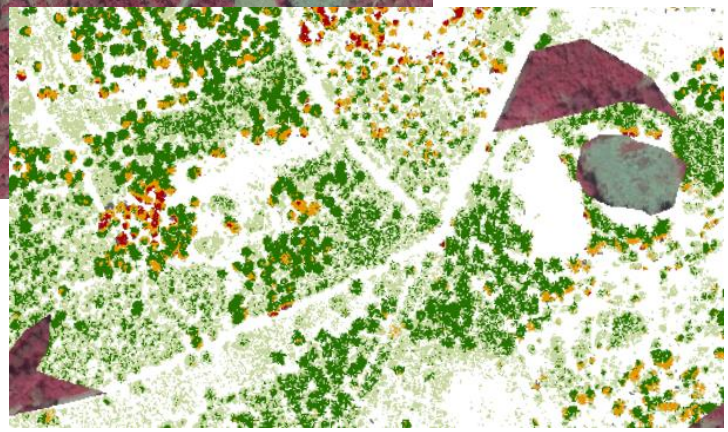


Bronnen: Arkajun 2013 Wikipedia & Samvedan 2020 rsgislearn.com

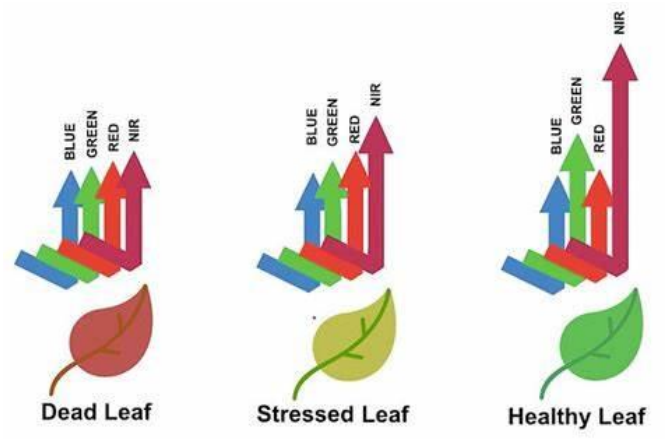
Het lichtspectrum en remote sensing

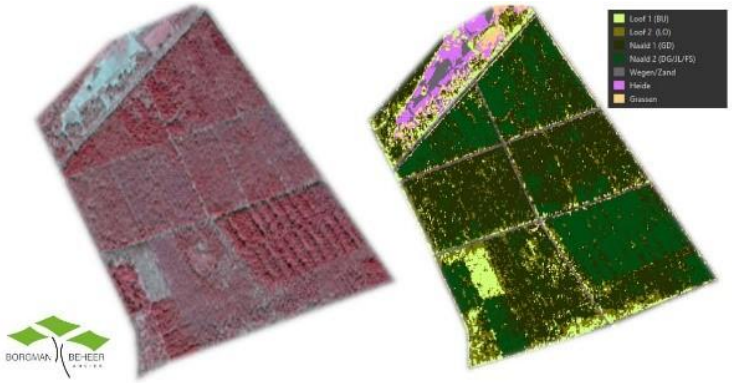
- *RGB + NIR*
  - *Spectral Indices* (bijv. NDVI)
  - Beeldclassificatie





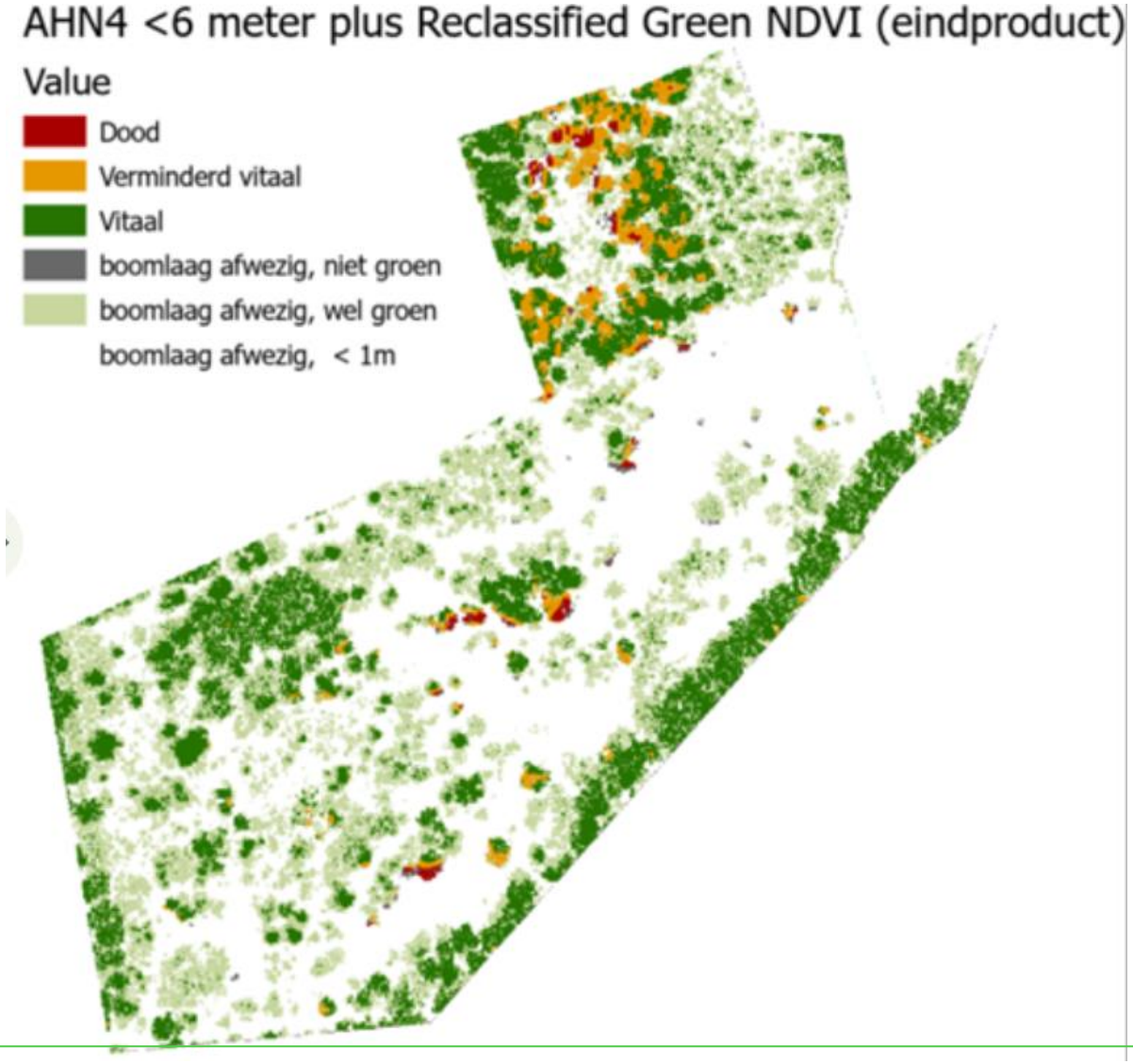
$$\mathrm{NDVI} = \frac{(\mathrm{NIR} - \mathrm{VIS})}{(\mathrm{NIR} + \mathrm{VIS})}$$



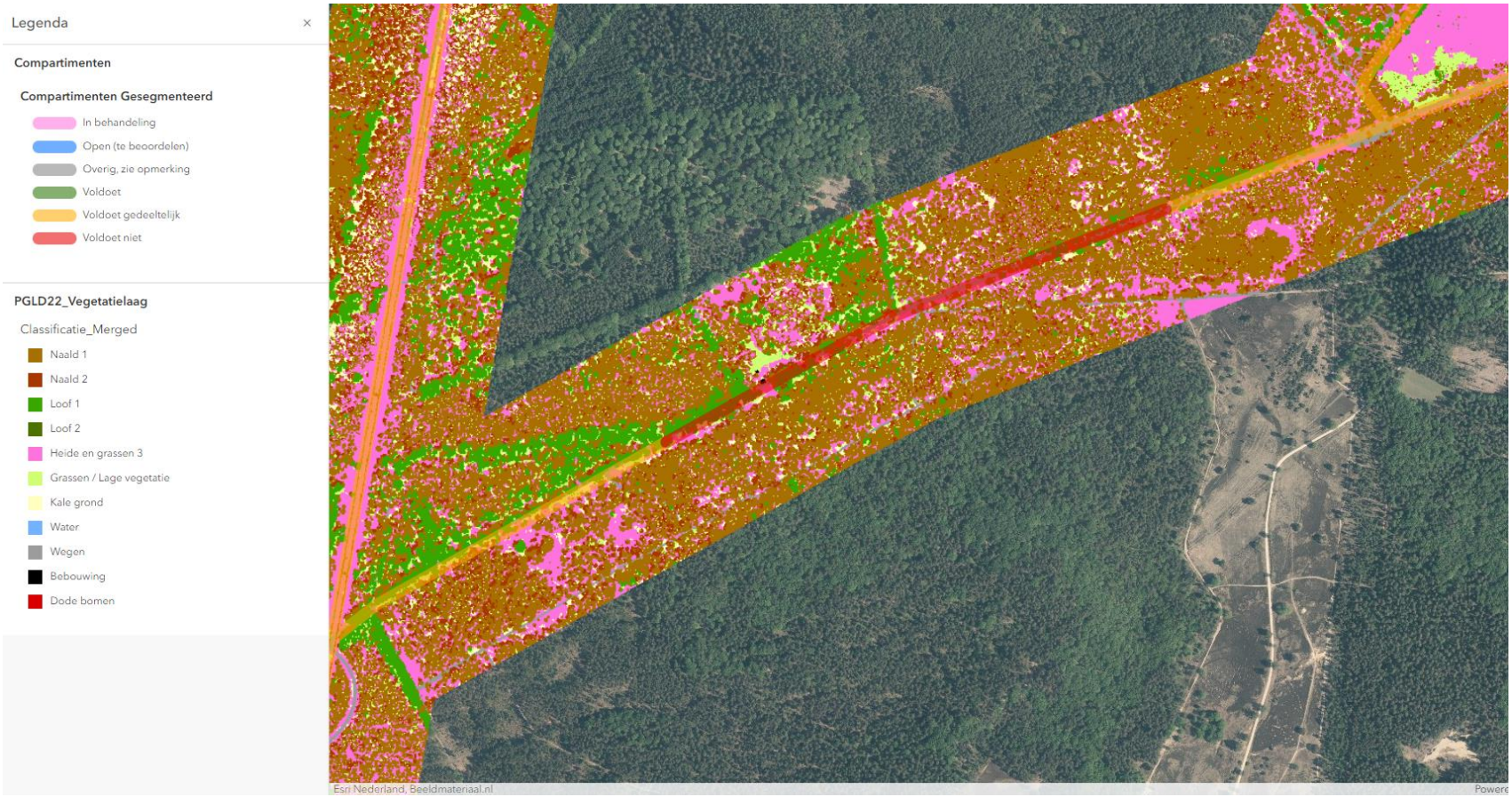


Bronnen:
firewatchteam.com 2023
N. Spliethof 2022 – Borgman Beheer Advies

Het lichtspectrum en remote sensing

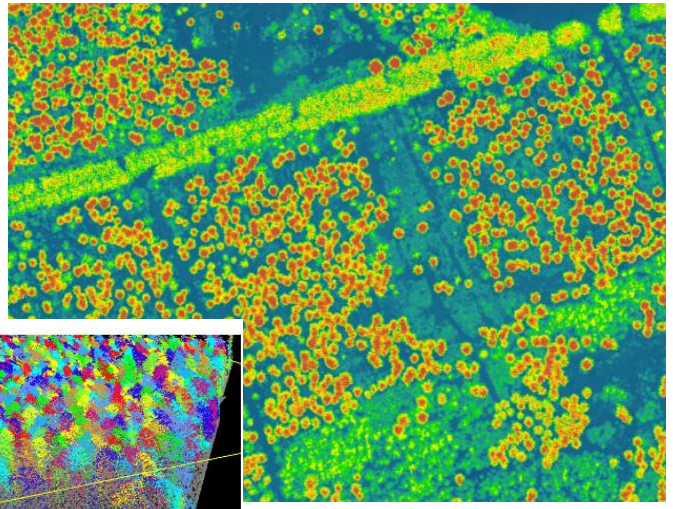


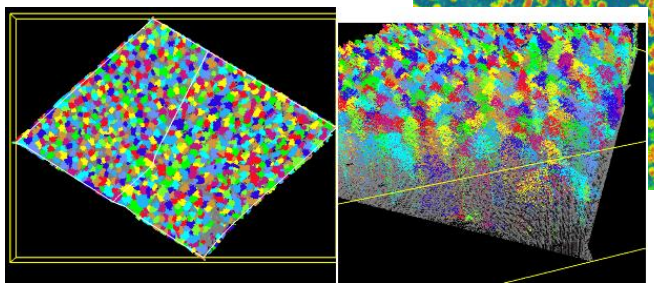
Het lichtspectrum en remote sensing

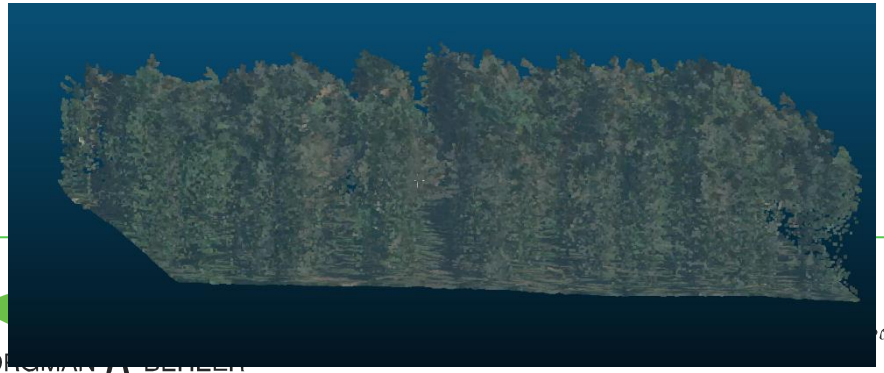


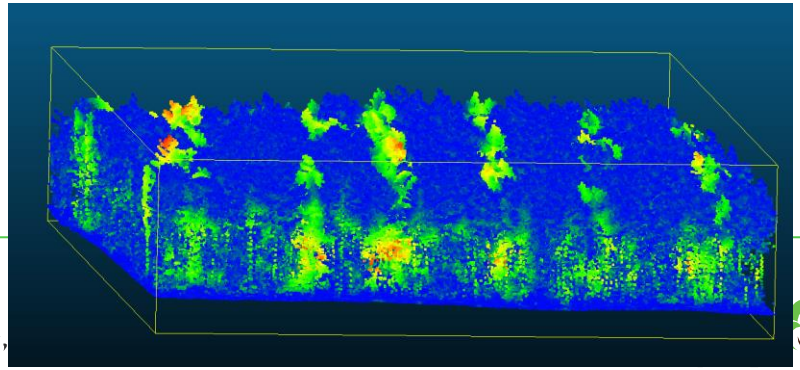
LiDAR (Laserscanning)

- *Actieve Sensor*
- (3D) X, Y & Z
- Airborne of Terrestrial

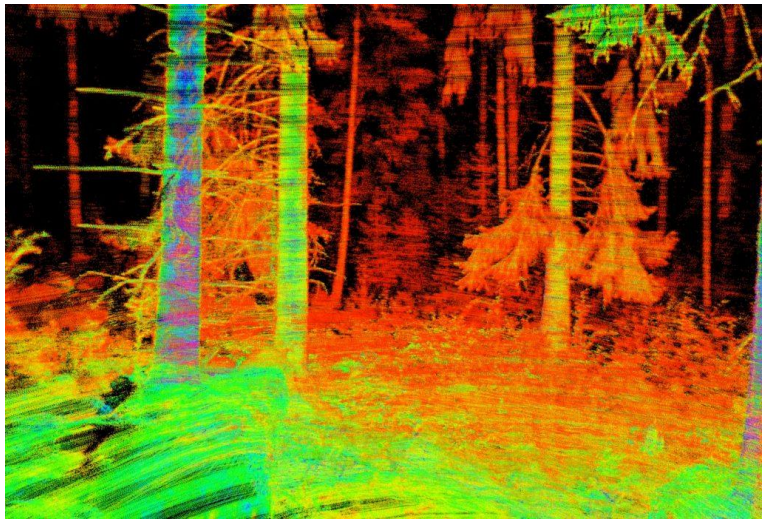


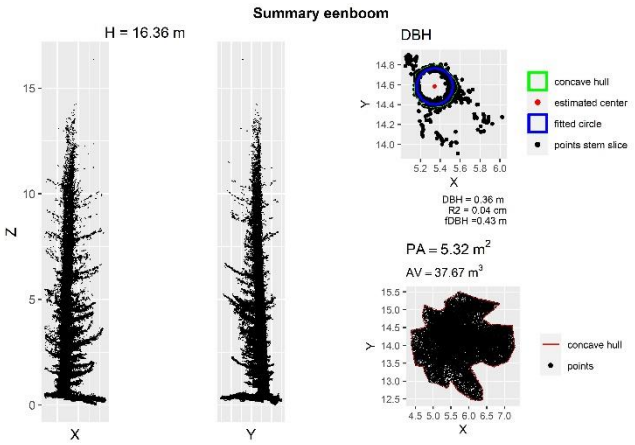


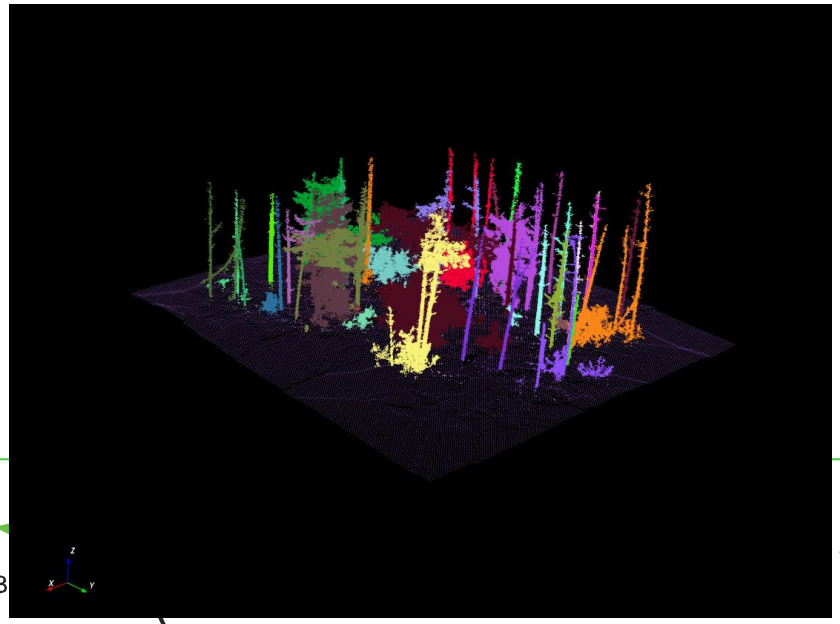


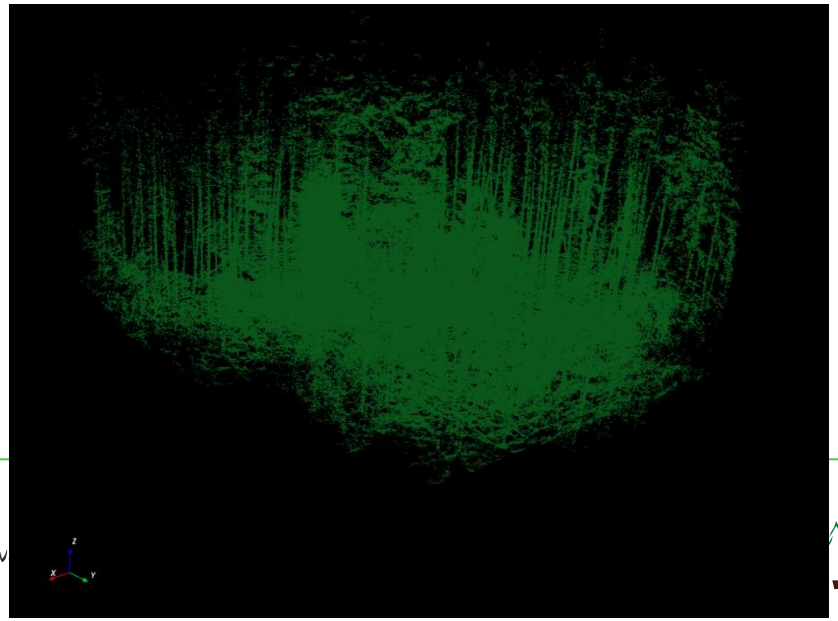


LiDAR (Laserscanning)

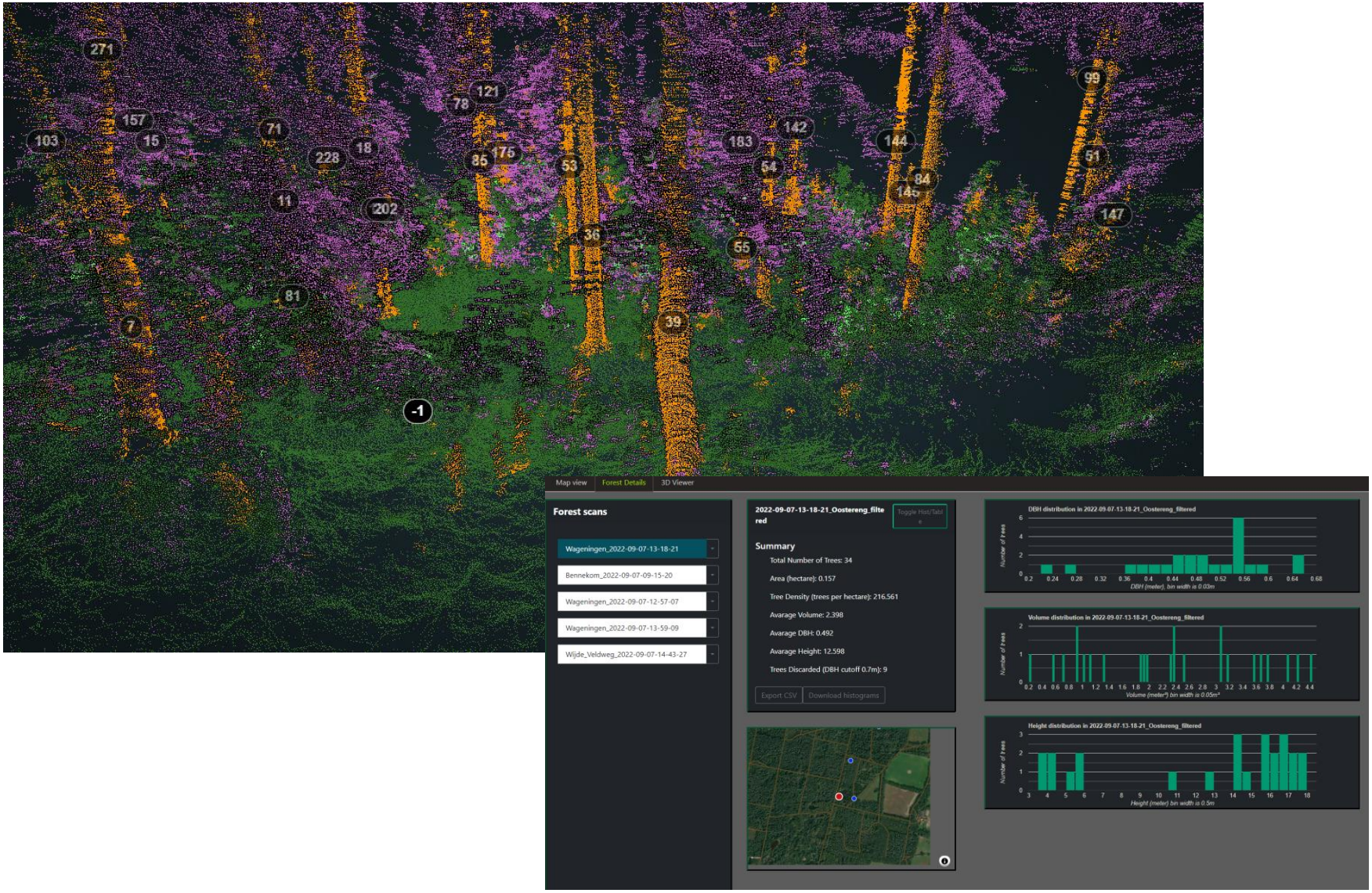




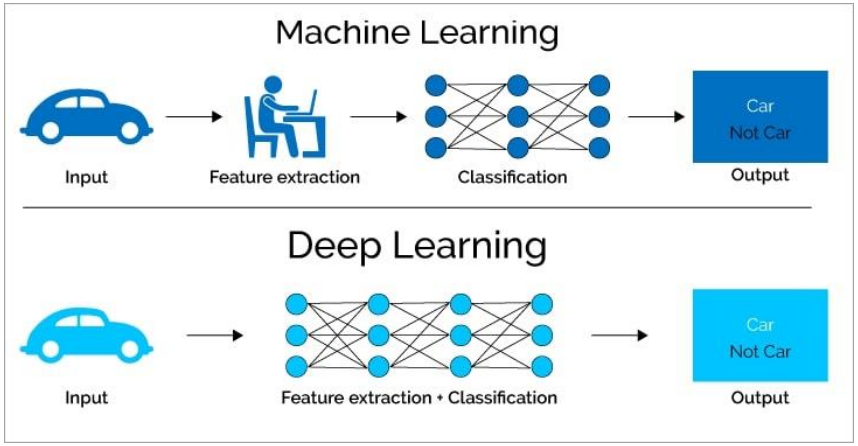


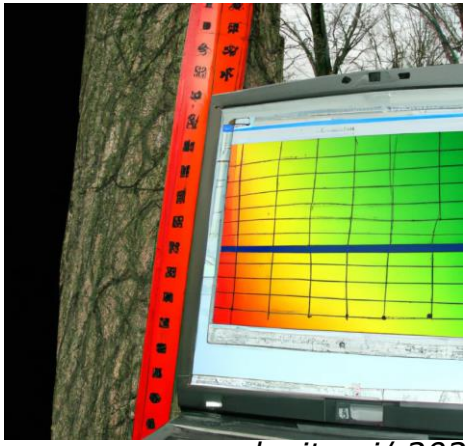


LiDAR (Laserscanning)



Machine Learning, Deep Learning of Neural Networks



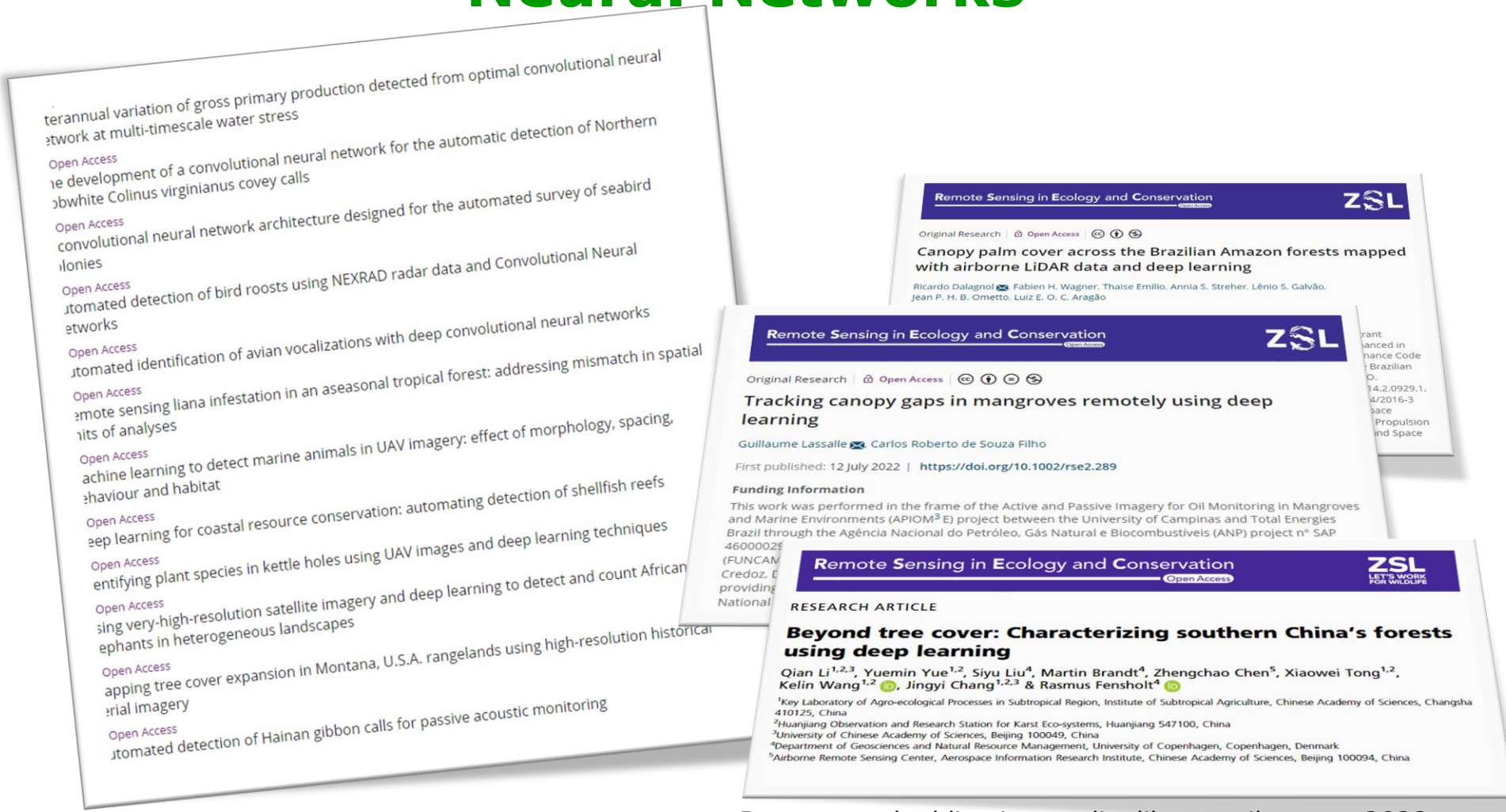


levity.ai/ 2023
DALL-E
N. Spliethof 2022 – Borgman Beheer Advies

Machine Learning, Deep Learning of Neural Networks

Bron: N. Spliethof 2022 – Borgman Beheer Advies

Machine Learning, Deep Learning of Neural Networks



Bronnen: zslpublications.onlinelibrary.wiley.com 2023

KATAM FOREST MINI

KATAM

https://www.youtube.com/watch?time_continue=31&v=ivPw7nV2qxo&feature=emb_logo

KATAM FOREST MINI

Class 1 – Supported (recommended for beginners)

Class 2 – Supported (after some training)

Class 3 – Supported (requires very good recording skills)

Class 4 – Not supported

ARBOREAL APP

Products

Arboreal Forest - a real digital caliper

Now you can measure Diameter, Basal Area, Height, Tree species, Trees per hectar and calculate volumes.

- Great accuracy
- Easy to use
- Get the result immediately
- Measure in a circle plot or along a transect
- Sync the result to the cloud
- See the results on a map
- Show results from many plots

Read more!

Verschil in complexiteit

Remote sensing ondersteunend op diverse niveau's:

- Vegetatie aanwezig ja/nee
- Type vegetatie
- (Boom)soortherkenning
- Data individuele boom: o.a. volume
- …

Complexiteit en schaalniveau bepaalt type data: veldmeting en/of remote

Uitdagingen

Uitdagingen

Uitdagingen

Foto: Fons Voncken (NBI-8)

Uitdagingen

Blik vooruit

Hybride-inventarisatie:

- Veldwerk blijft basis en onmisbaar
- Remote sensing gaat nieuwe en verdiepende inzichten toevoegen: inzet LiDAR, RGB, NDVI

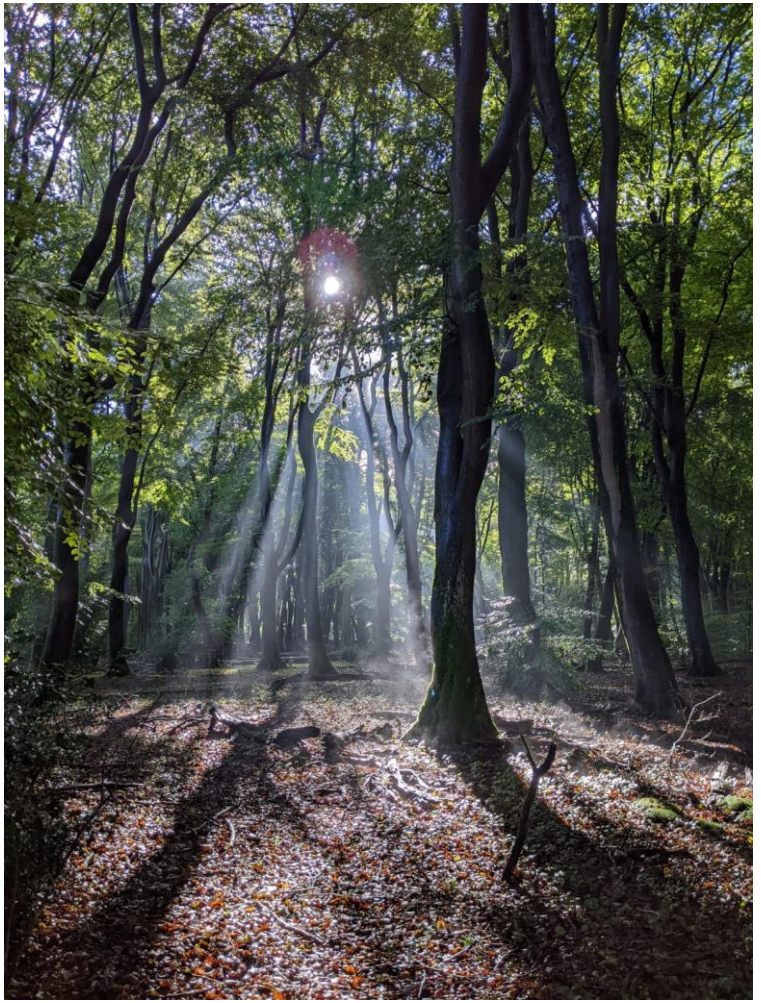
Blik vooruit

Combineren van datasets – toepassen deep learning:

- Bosinventarisatie-data
- Remote sensing: LiDAR en Lichtspectrum
- Flora- en Fauna
- Bodemdata
- Hydrologie / vocht
- Recreatie: bezoekersaantallen en bewegingen
- ….
- ???

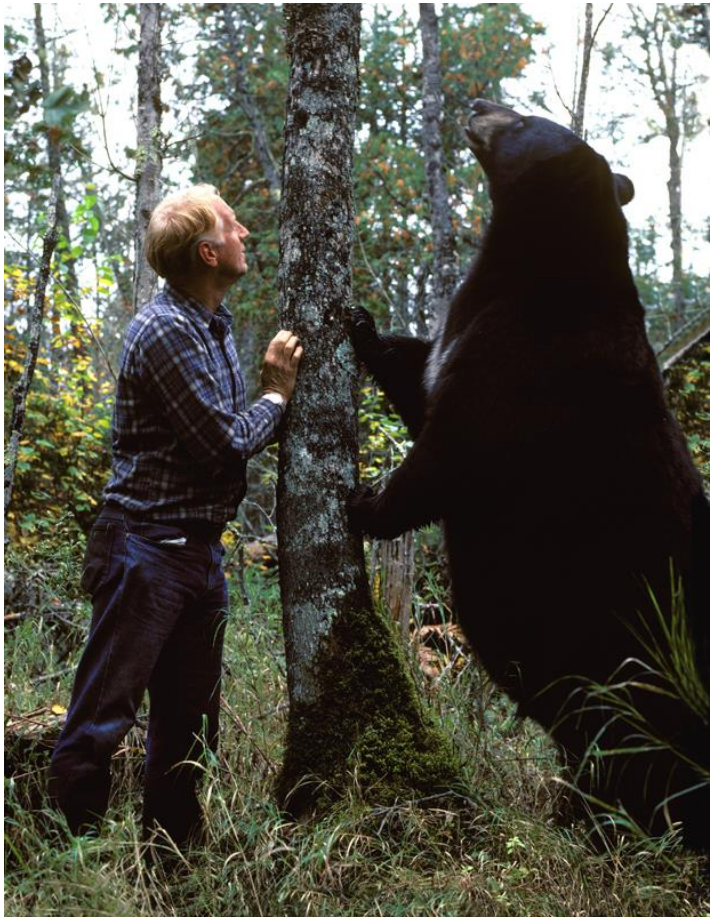
Blik vooruit

- Veldwerk: ‘way-of-life’
- Karakter veldwerk veranderd dankzij nieuwe techniek
- Zelf observeren en meten blijft cruciaal



Vragen?

Dank voor uw aandacht!



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