

UAV-based Land Cal/Val activities over temperate and tropical forest sites

IDEAS-QA4EO WebEx meeting, 2020-12-02

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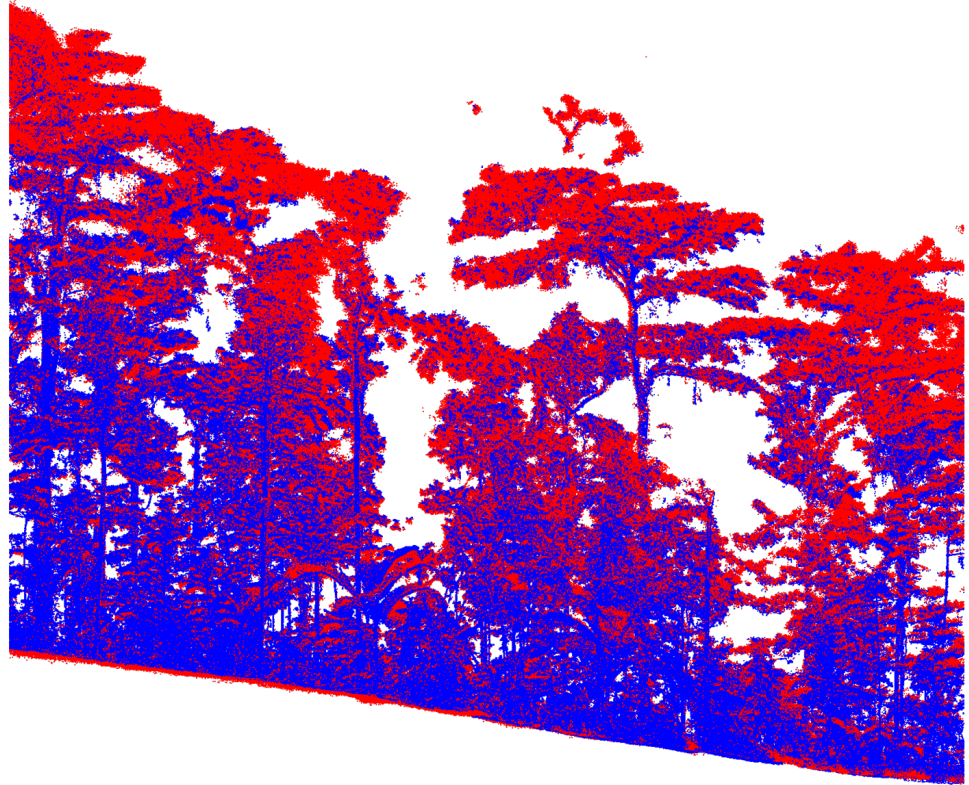
Overview

1. UAV-LS campaign in French Guiana (AGB/BIOMASS/GEDI)
2. Monitoring activities at Speulderbos (LAI)
3. Additional activities

1. UAV-LS campaign in French Guiana

Co-registration

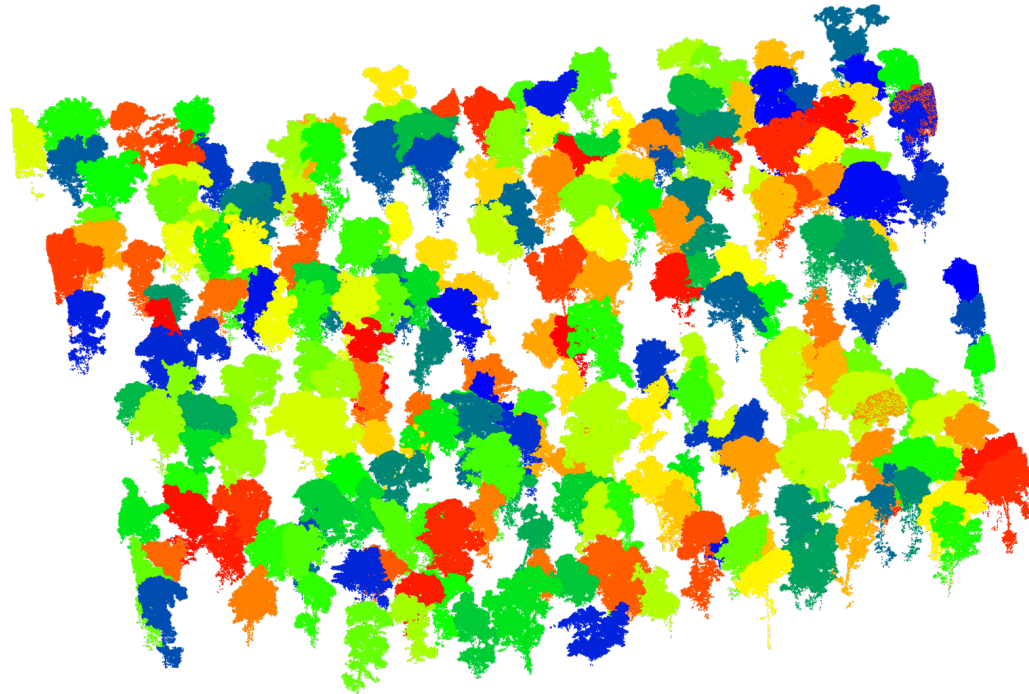
- 4 ha
- ~900 TLS positions
- 6 UAV-LS flights



1. UAV-LS campaign in French Guiana

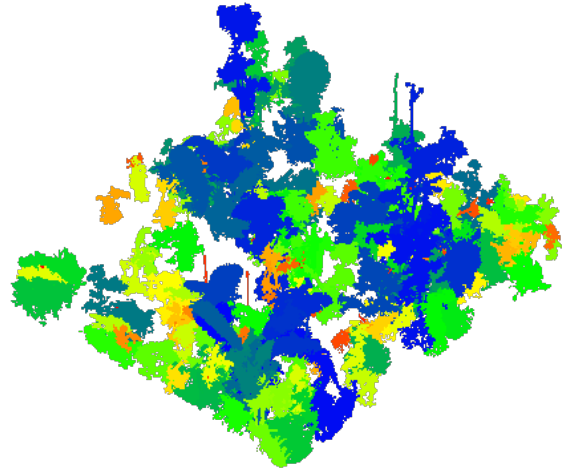
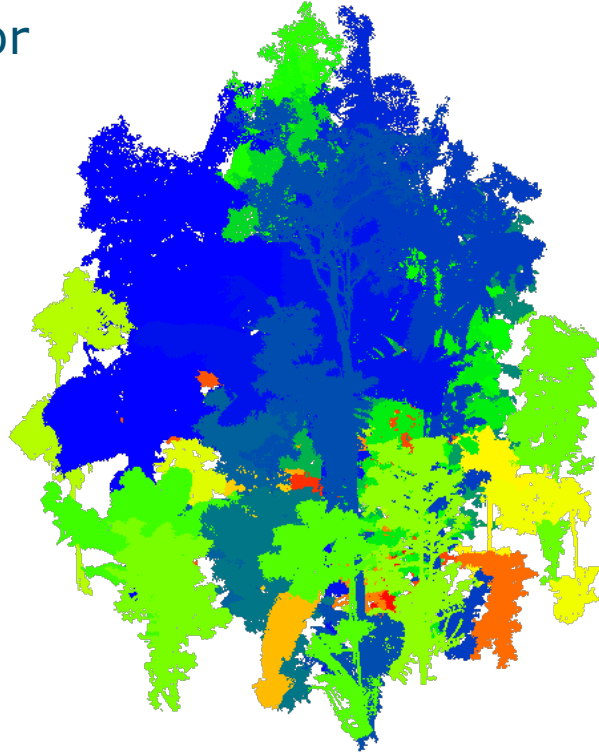
Individual tree segmentation
(with Pasi Raumonon, Tampere
University)

- + UAV version
- + Working with large plots/tiling
- + Multi-core/multi-PC processing
- + Keep point cloud attributes (e.g. return number, scan position) in output

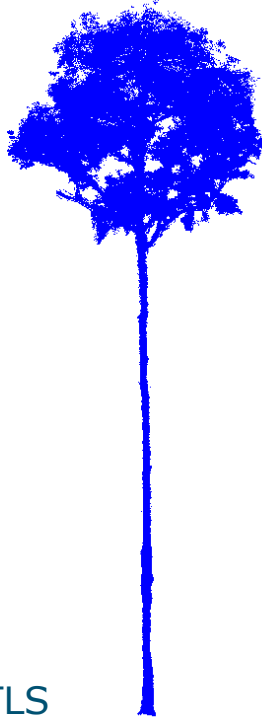


1. UAV-LS campaign in French Guiana

TLS segmentation for
15 m x 15 m tile



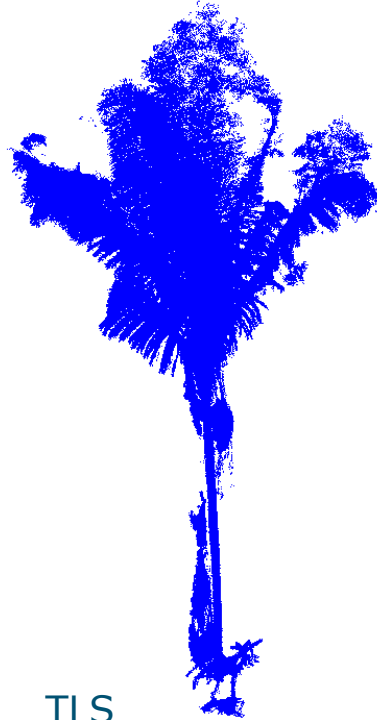
1. UAV-LS campaign in French Guiana



TLS



UAV-LS



TLS

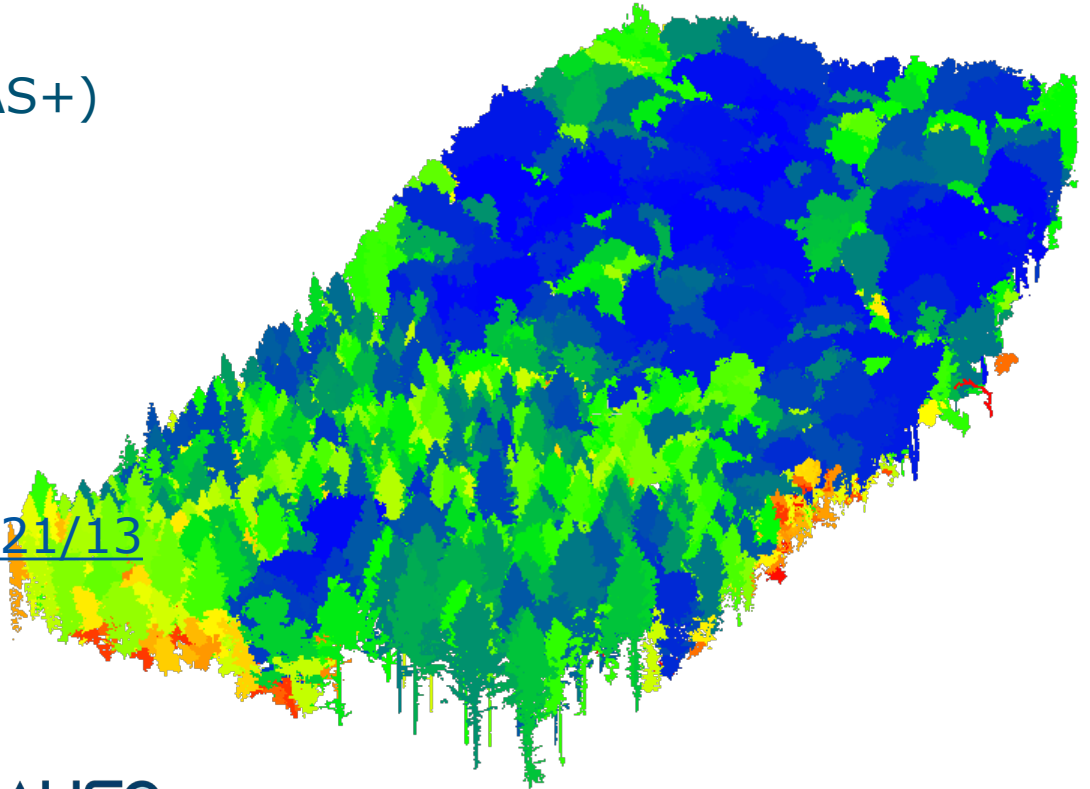


UAV-LS

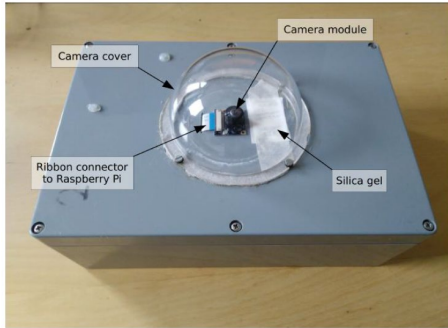
1. UAV-LS campaign in French Guiana

Speulderbos dataset (IDEAS+)

- 965 tree (objects)
- TLS/UAV-LS co-aligned
- Published at <https://dx.doi.org/10.4121/13061306.v1>



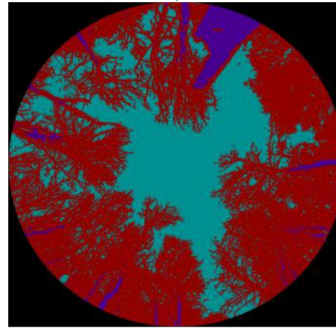
2. Monitoring activities at Speulderbos



PiLAI 1.0 (Vellekoop 2019)



PiLAI 2.0 (concept)



PiLAI 1.0 image & classification (Vellekoop 2019)

“Community” sensor:

- open source/codes
- Cost-effective components
- DIY community supported libraries
- Use wireless network technology (IoT)
- keep adoption thresholds low

Vellekoop (2019) <https://edepot.wur.nl/517981>

2. Monitoring activities at Speulderbos



- Purchase of LEAF MkI - In-Situ Monitoring LiDAR
- NIR-LiDAR (905 nm)

2. Monitoring activities at Speulderbos



- Purchase TreeTalker TT+ (v3) site package (~20 sensors)
- Integrated sensor
 - Sap flow
 - Tree movement
 - Canopy light transmission in 12 spectral bands (VIS / NIR)
- Sensor characterization? (NPL, PMOD?)

3. Additional activities

- 2020: Contributions to CEOS LPV AGB best practice protocol
- 2020: UAV-LS agriculture campaign

- 2021: Accepted sessions @ IGARSS 2021, Brussels
 - “UAV and low-cost sensor networks for Land monitoring and Cal/Val” (chaired with Fabrizio)
 - “UAV for mapping and monitoring of forest ecosystems” (chaired with Sruthi Moorthy, Ghent University)
- 2021: Eifel UAV-LS/MLS campaign (Covid-dependent)

Thank you for the attention!



Take off! at Paracou, French Guiana