

Laserchicken

Scalable flexible point cloud processing in Python

netherlands
eScience center

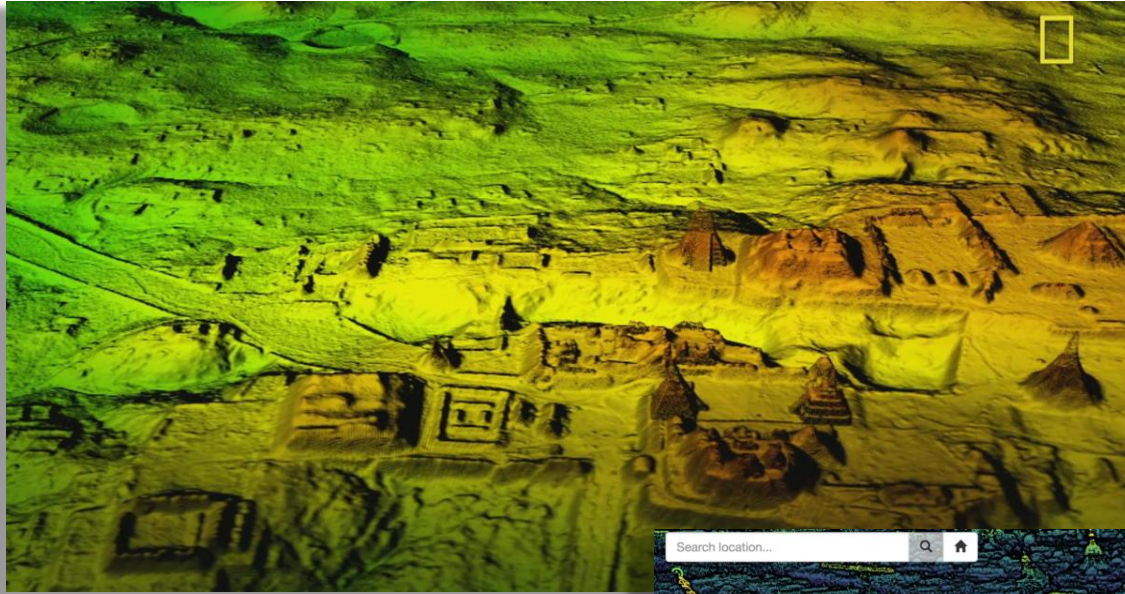
PI: W.D. Kissling

eScience: M.W. Grootes, C. Meijer, F. Nattino, O. Ku



eEcoLiDAR



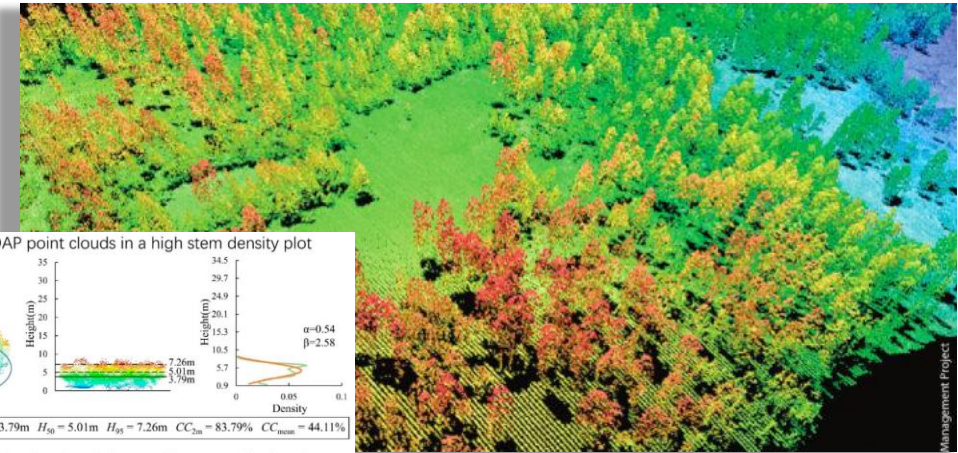
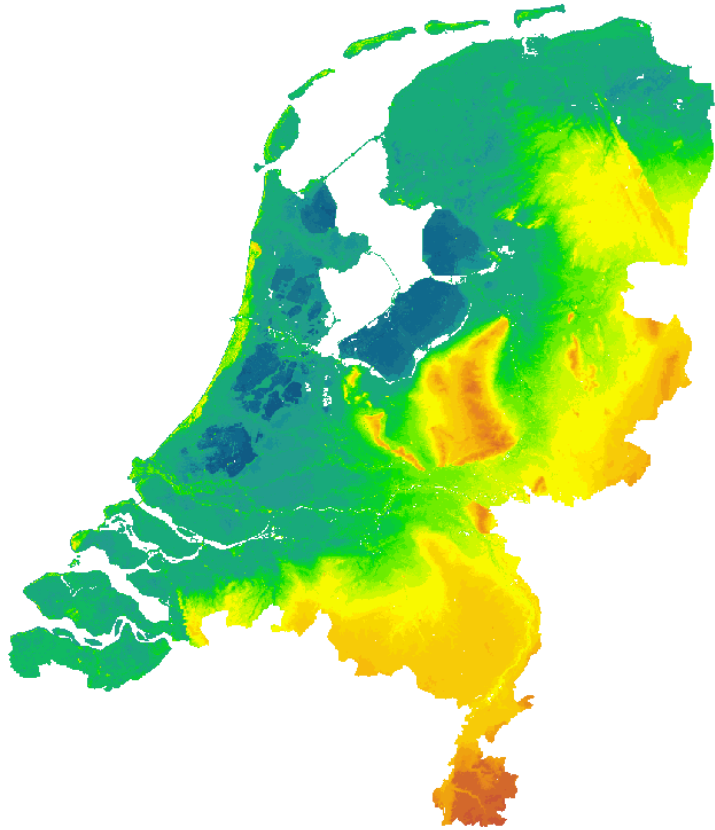


Credit: Nat Geo CC-BY-2.0

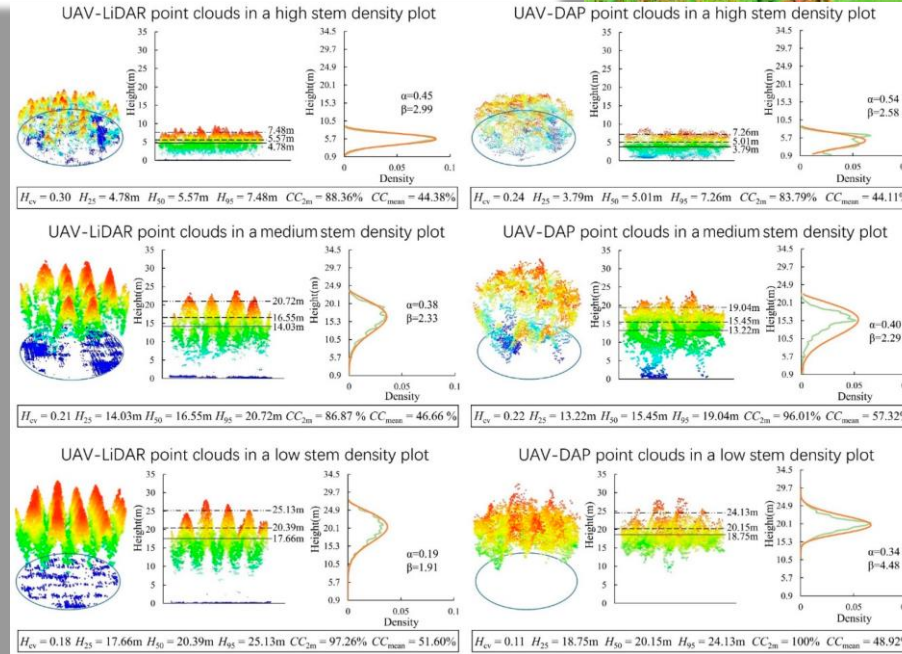


Credit: California Agriculture





L. Cao et al. *Forests* 2019, DOI: 10.3390/f10020145



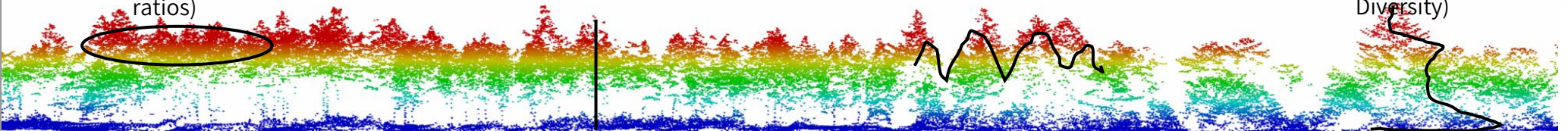
Credit: California Agriculture

Cover
(e.g. canopy cover, penetration ratios)

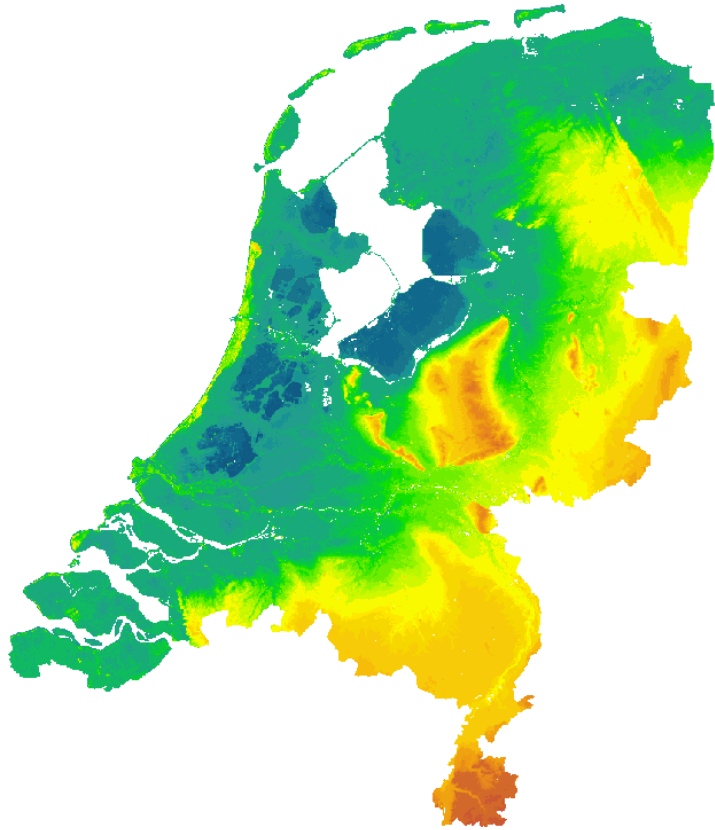
Height
(e.g. mean, maximum)

Horizontal variability
(e.g. canopy height heterogeneity)

Vertical variability
(e.g. Shannon evenness, Foliage Height Diversity)



- TB of high-resolution data → scalable software required
- Scientific use cases require high degree of customisability
- Open Science requires FOSS solutions
- Low entry barrier → Python

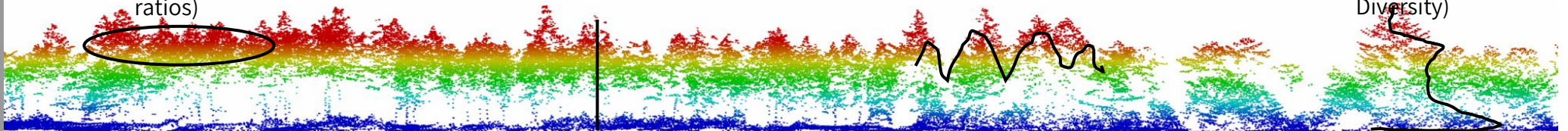


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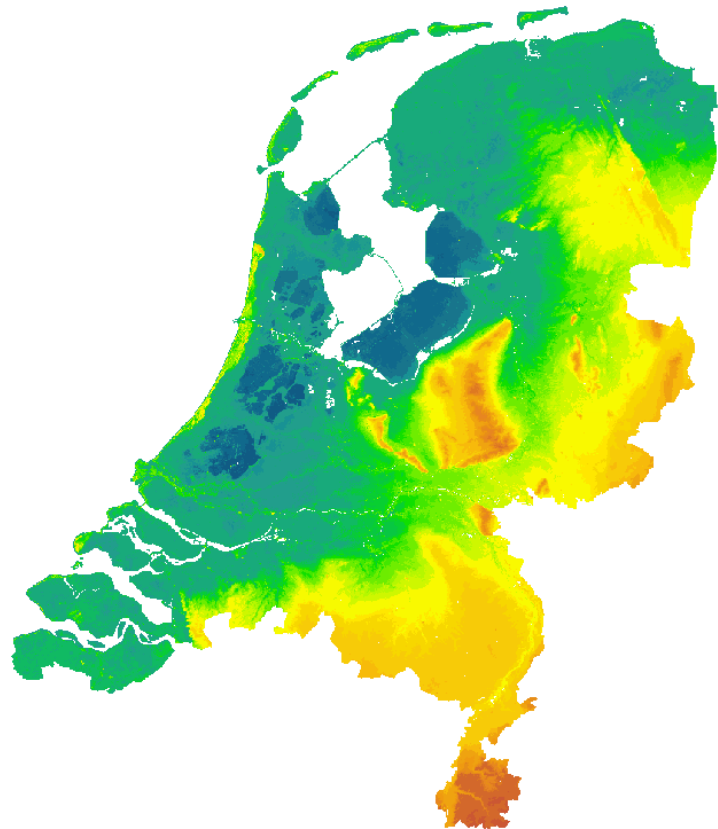
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Laserchicken point cloud processing library

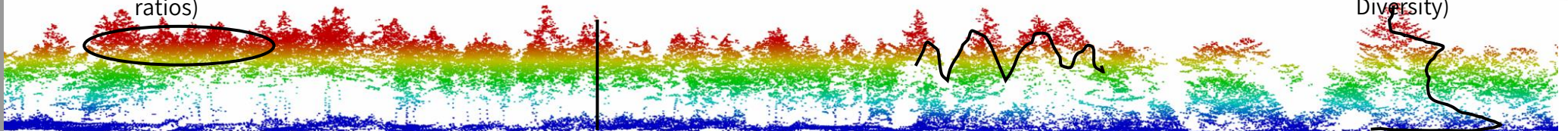


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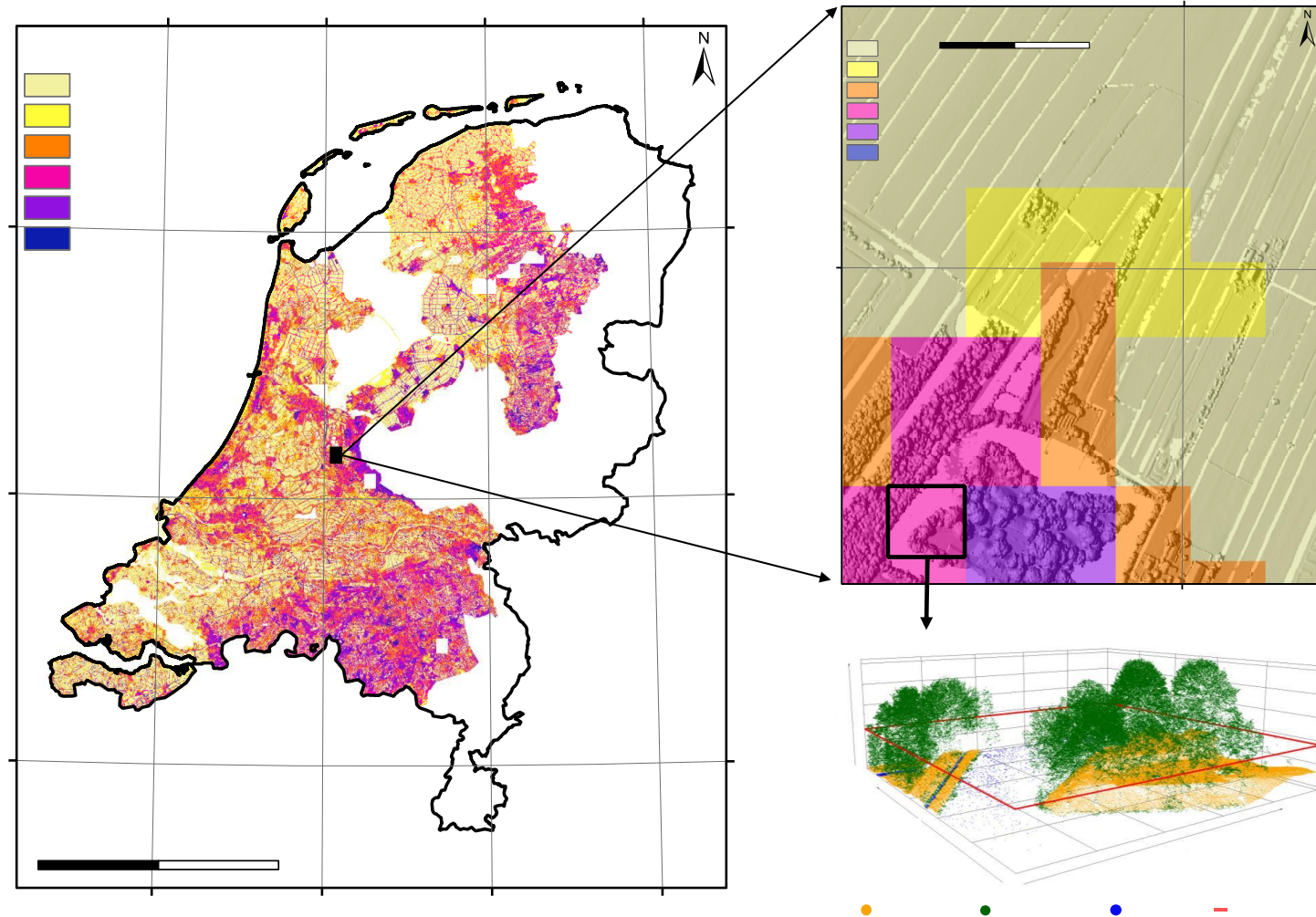
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Modularity – Laserfarm and laserchicken

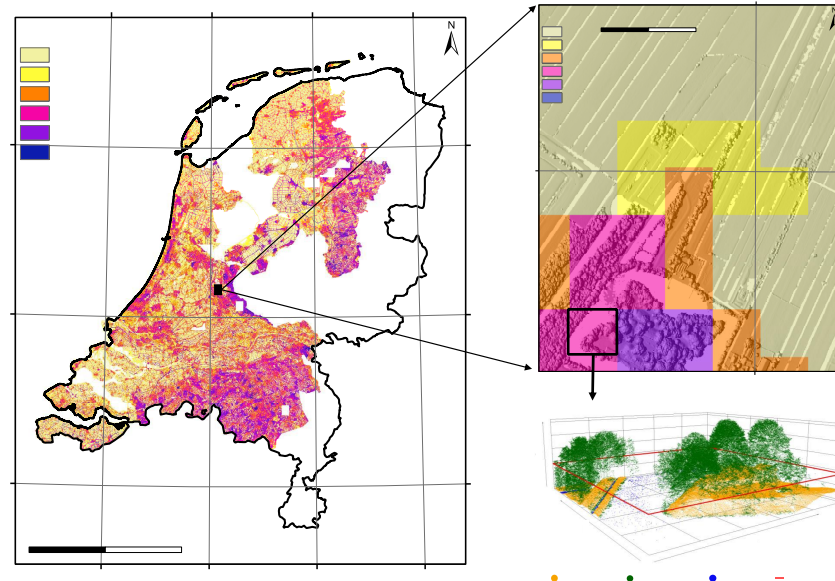
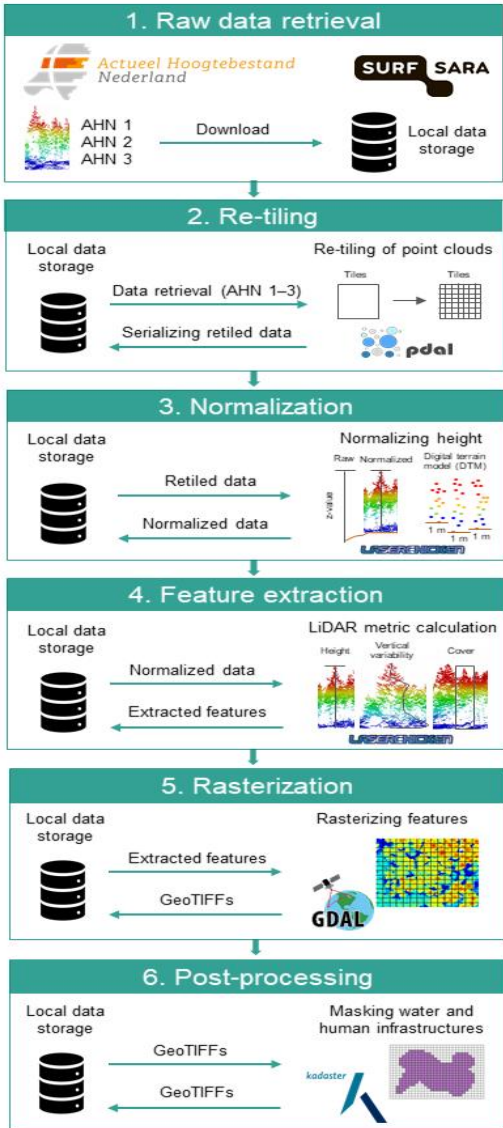


C.Meijer, MWG, et al., Software X, 2020



Modularity – Laserfarm and laserchicken

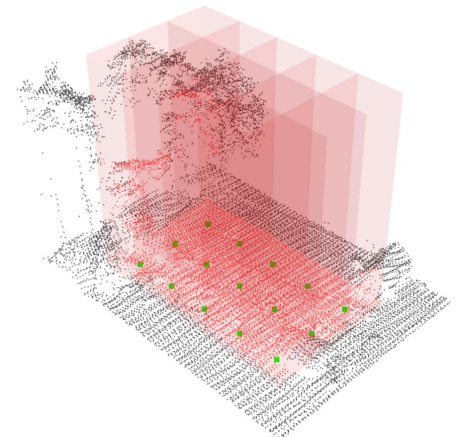
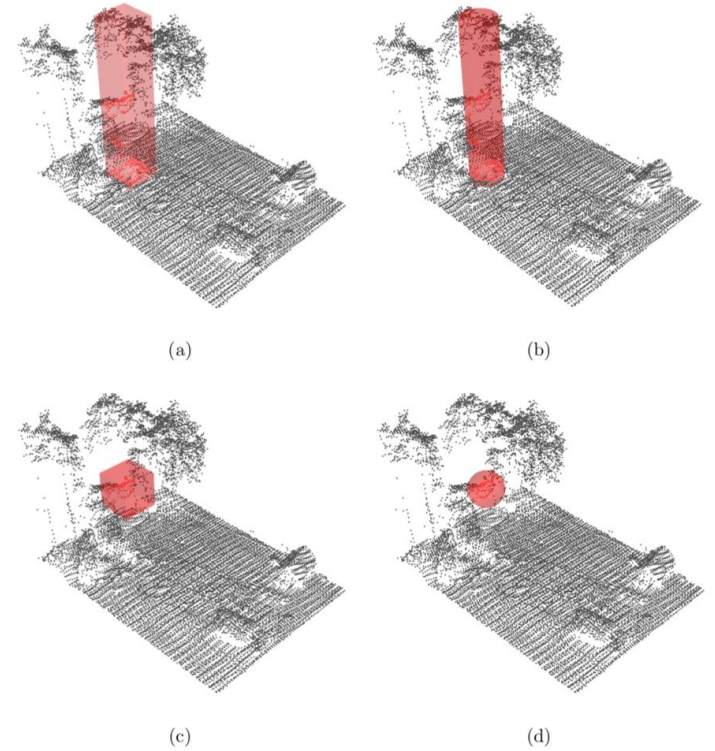
Kissling, ..., MWG, Ecological Informatics, 2022



← Laserfarm [Framework]

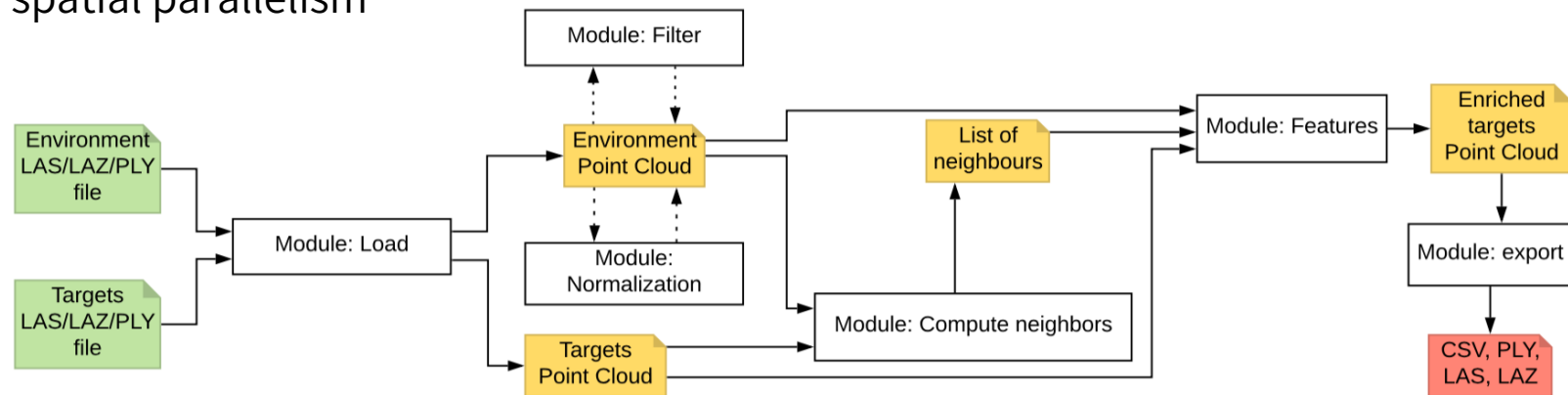
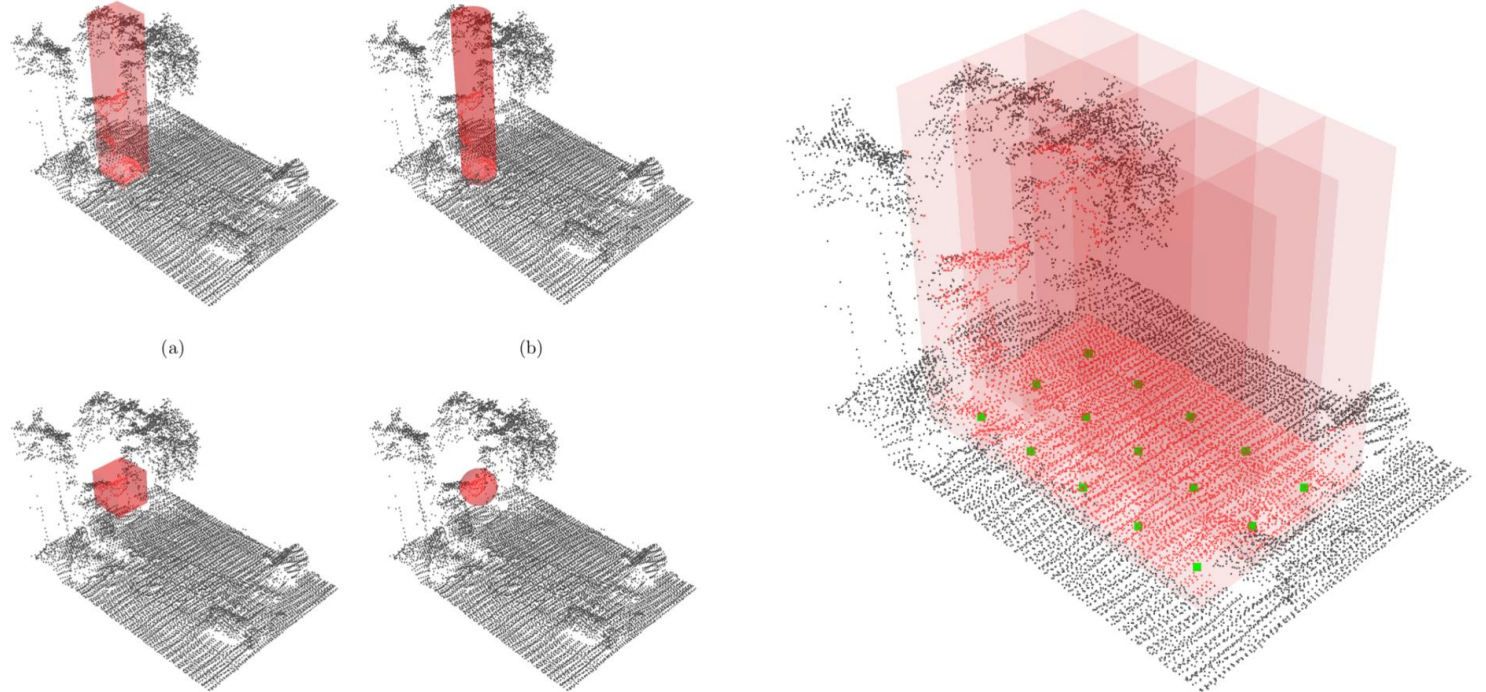
Laserchicken PC processing library →

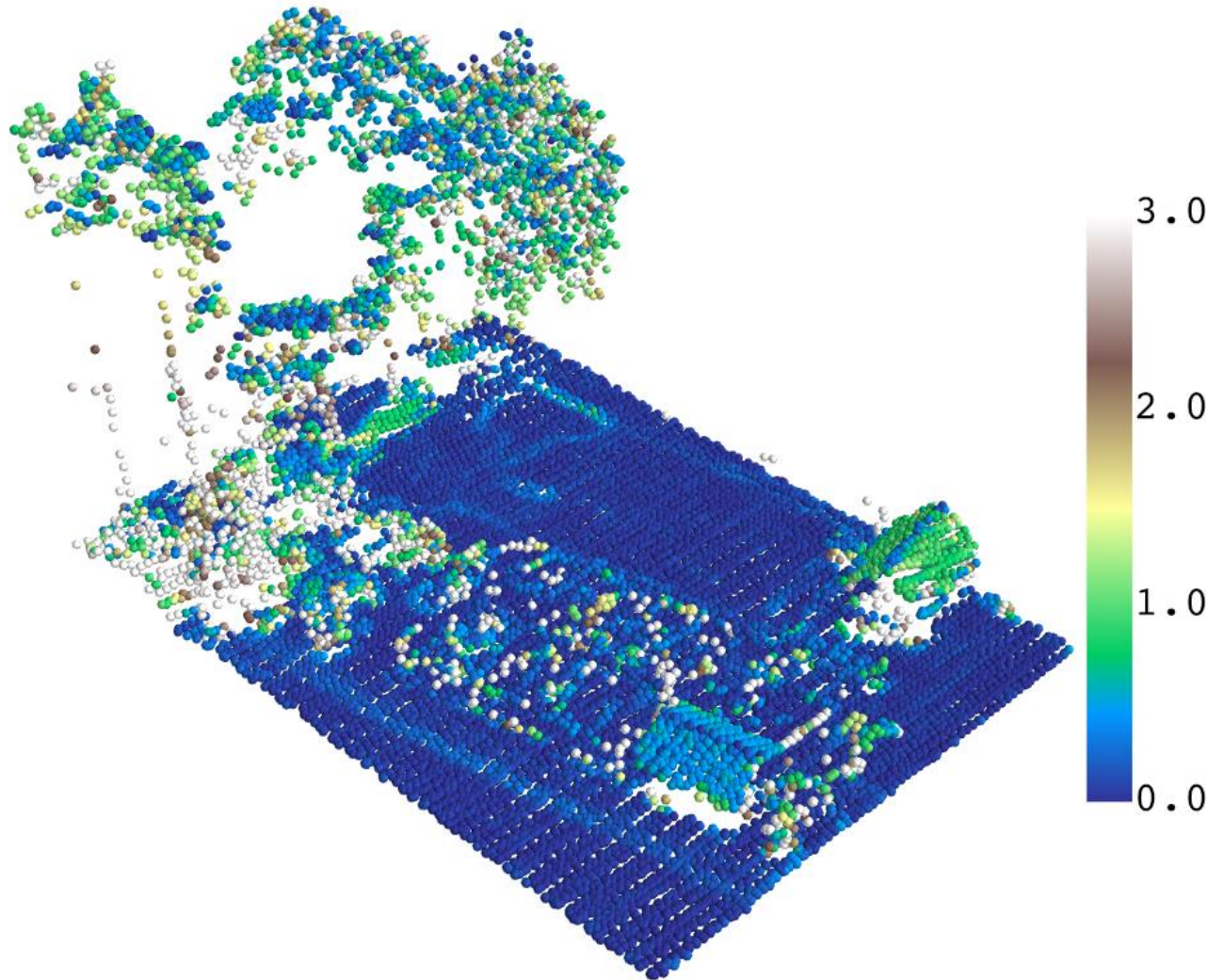
Modularity for simplicity and enhanced reusability



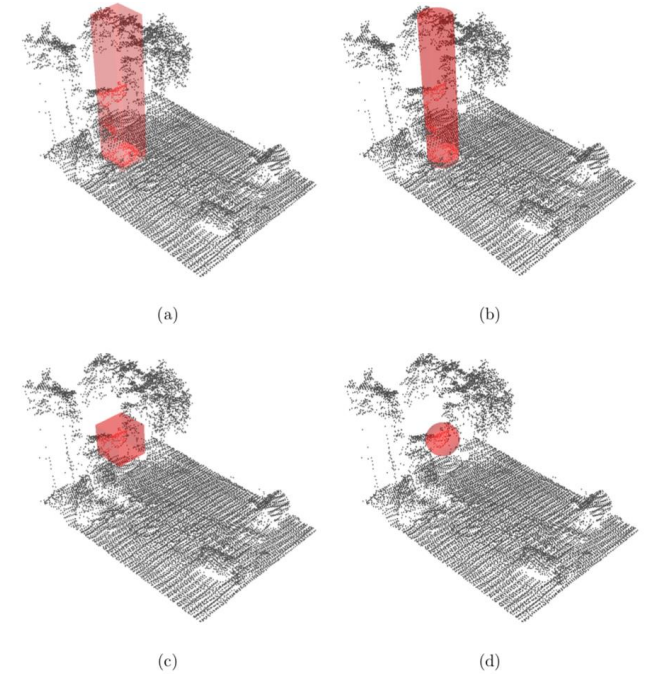
C.Meijer, MWG, et al., Software X, 2020

- Pre-implemented and fully user defined metrics/features
- Novel target point cloud concept
- Entirely flexible user defined definition of subsets/neighbourhoods
- Enables everything from raster/voxel based to point based processing
- Vectorized single process python, arbitrarily scalable via spatial parallelism





C.Meijer, MWG, et al., Software X, 2020



C.Meijer, MWG, et al., Software X, 2020

Laserchicken can easily be employed as a stage in a larger processing chain, e.g. object/plane detection



Fine-scale habitat niches of wetland birds derived from country-wide Airborne Laser Scanning data



UNIVERSITEIT VAN AMSTERDAM



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R. Foppen^{3,4,5}, W. Bouten¹ & W. D. Kissling¹

¹ University of Amsterdam, Institute for Biodiversity and Ecosystem Dynamics (IBED), Amsterdam, The Netherlands,

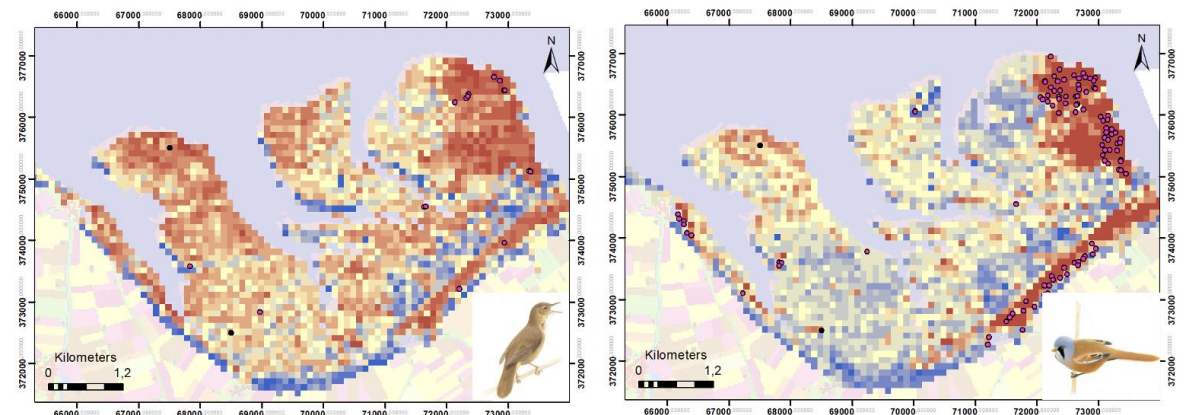
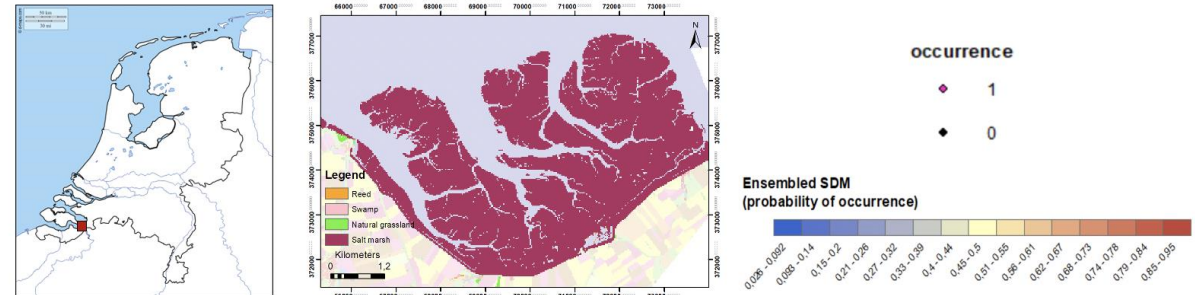
² Netherlands eScience Center, Amsterdam, The Netherlands

³ Sovon Dutch Centre for Field Ornithology, Nijmegen, The Netherlands

⁴ European Bird Census Council (EBCC)

⁵ Department of Animal Ecology and Ecophysiology, Institute for Water and Wetland Research, Radboud University, Nijmegen, The Netherlands

Results of SDM





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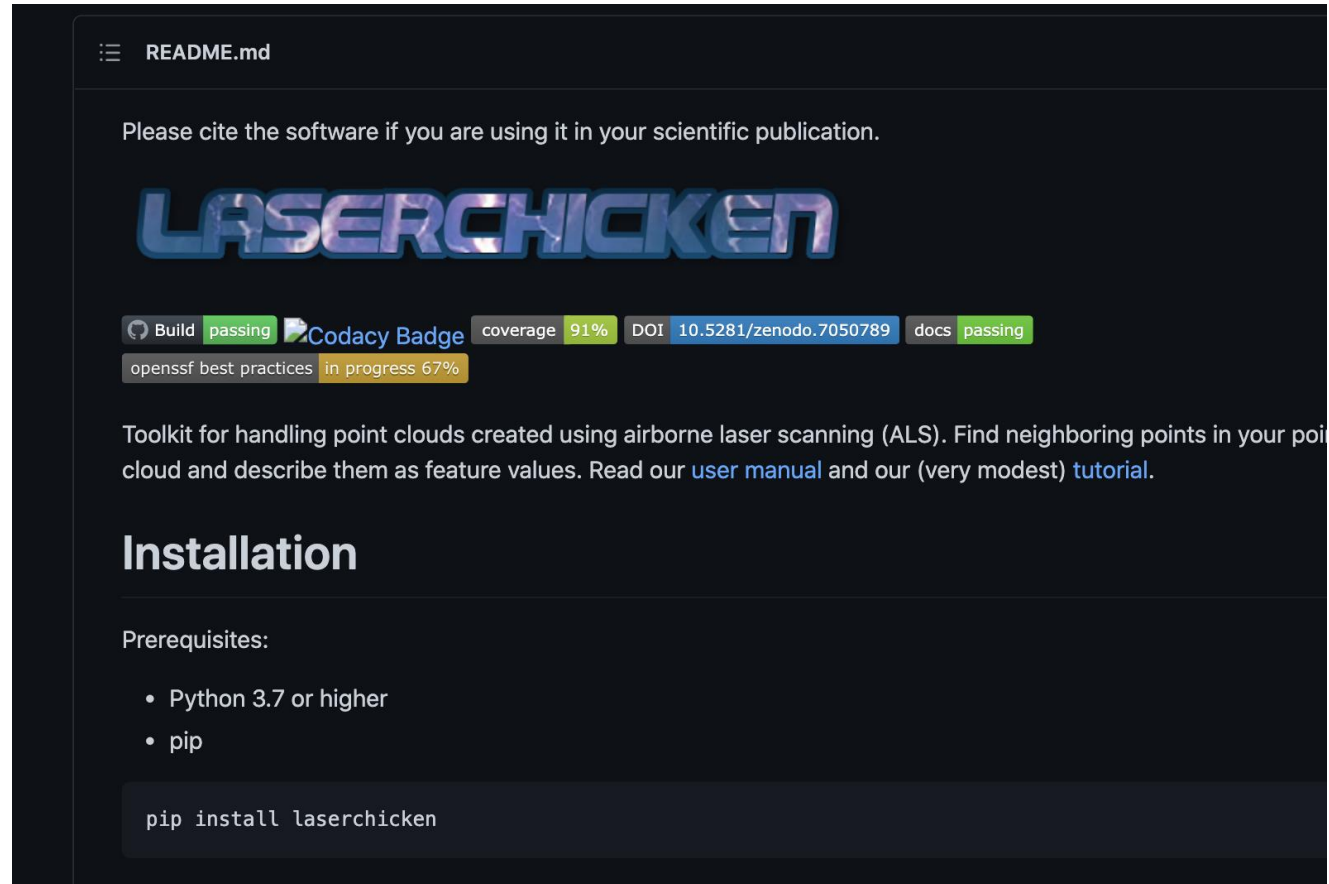
11 forks

Integration and adoption in community projects

Issues:

Few/no resources for maintenance/development

Result of project nature



README.md

Please cite the software if you are using it in your scientific publication.

LASERCHICKEN

Build passing Codacy Badge coverage 91% DOI [10.5281/zenodo.7050789](https://doi.org/10.5281/zenodo.7050789) docs passing
openssf best practices in progress 67%

Toolkit for handling point clouds created using airborne laser scanning (ALS). Find neighboring points in your point cloud and describe them as feature values. Read our [user manual](#) and our (very modest) [tutorial](#).

Installation

Prerequisites:

- Python 3.7 or higher
- pip

```
pip install laserchicken
```


<https://github.com/eEcoLiDAR/laserchicken>



Let's stay in touch

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