



EvoLand
LAND MONITORING EVOLUTION

D2.6 Novel EO Derived Generic Datasets pre- processing software - final version

Work Package 2 – Methods Development

Authors: Brunet Pierre-Marie (CNES)

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Full Title	Evolution of the Copernicus Land Service portfolio (integrating novel EO data and latest machine learning algorithms to continuously monitor the status, dynamics and biomass of the land surface)			
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Lead author	Brunet Pierre-Marie		Email	Pierre-marie.brunet@cnes.fr
Other authors	Brunet Pierre-Marie, Barroso Thérèse, Youssefi David, Lallement Dimitri			
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0.1	20.03.2023	Draft	Creation	CNES
1.0	03.03.2025	Final	Software update and review	CNES

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1 CARS DSM

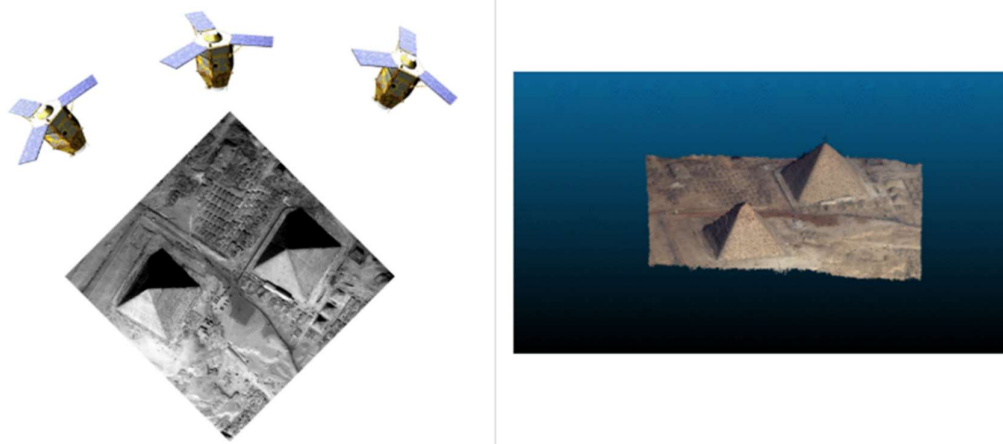


Figure 1. CARS DSM computation example.

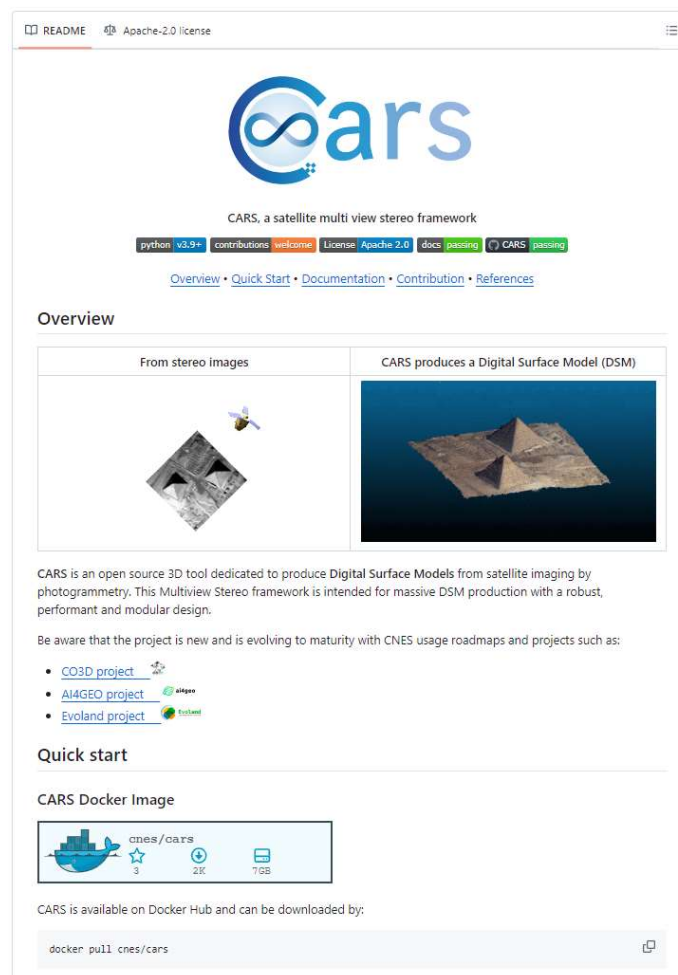


Figure 2. CARS GitHub webpage.



Description	
Name	CARS
Description	CARS is a dedicated and open source 3D tool to produce Digital Surface Models from satellite imaging by photogrammetry.
Version	0.11
Access	GitHub : https://github.com/cnes/cars PyPI : https://pypi.org/project/cars
License	Apache-2.0 license
DOI	10.1109/IGARSS39084.2020.9324020
Citation	D. Youssefi et al., "CARS: A Photogrammetry Pipeline Using Dask Graphs to Construct A Global 3D Model," IGARSS 2020 - 2020 IEEE International Geoscience and Remote Sensing Symposium, Waikoloa, HI, USA, 2020, pp. 453-456, doi: 10.1109/IGARSS39084.2020.9324020



2 Bulldozer

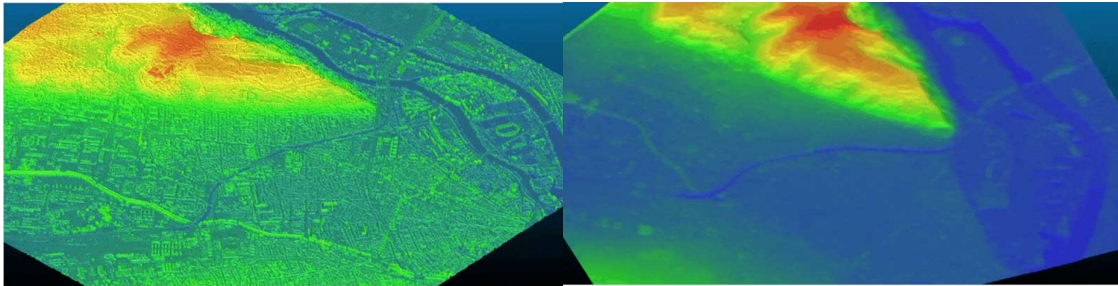


Figure 3. Bulldozer DTM extracted from the DSM example.

[README](#) [Apache-2.0 license](#)

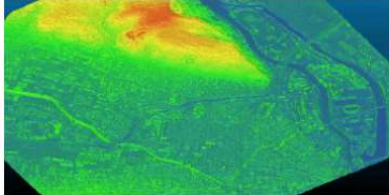


Bulldozer

Bulldozer, a DTM extraction tool requiring only a DSM as input.

[python v3.8+](#) [contributions](#) [welcome!](#) [License Apache 2.0](#) [pypi package v1.0.2](#)

Overview



Bulldozer is designed as a pipeline that aims to extract a *Digital Terrain Model* (DTM) from a *Digital Surface Model* (DSM). It supports both noisy satellite DSM and high-quality LiDAR DSM.

Quick Start

Installation

You can install **Bulldozer** by running the following command:

```
pip install bulldozer-dtm
```

Or you can clone the github repository and use the `Makefile`:

```
# Clone the project
git clone https://github.com/CNES/bulldozer.git
cd bulldozer/

# Create the virtual environment and install required dependencies
make install

# Activate the virtual env
source bulldozer_venv/bin/activate
```

Figure 4. Bulldozer GitHub webpage.



Description	
Name	Bulldozer
Description	Bulldozer is a DTM extraction tool requiring only a DSM as input.
Version	1.0.2
Access	GitHub : https://github.com/CNES/bulldozer PyPI : https://pypi.org/project/bulldozer-dtm/
License	Apache-2.0 license
DOI	10.5194/isprs-archives-XLVIII-4-W7-2023-89-2023
Citation	Lallement, D., Lassalle, P., and Ott, Y.: BULLDOZER, A FREE OPEN SOURCE SCALABLE SOFTWARE FOR DTM EXTRACTION, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLVIII-4/W7-2023, 89–94, 2023.



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