TerraMesh: A Planetary Mosaic of Multimodal Earth Observation Data

Supplementary Material

We provide pseudocode for generating S-2 RGB images and NDVI maps from Sentinel-2 L2A in Listing 1 and 2. We refer to Subsection 3.2 for a detailed description.

On the following pages, we present additional examples from both data sources in Figure 6 and 7. All examples are taken from each subset's first validation Zarr file, and we manually select representative samples to showcase the full range of landscapes. The focus on urban areas in SSL4EO-S12 is visible, which benefits the pre-training compared to homogeneous sampling. Because of the additional scaling for S2 RGB, the cloudy images are not very dark, while the clouds keep their structure and are not flattened to a single white value. Notice the alignment of the cloud and ice classes in the LULC data due to the augmentation using the SEnSeI v2 cloud and ice masks. We only annotate thick clouds as the land surface is still visible below thin cloud layers.

Listing 1. Pseudocode for the S-2-to-RGB transformation.

Listing 2. Pseudocode for the S-2-to-NDVI calculation.

```
def calculate_ndvi(b04, b08, offset=1000):
b04 = (b04 - offset).clip(0)
b08 = (b08 - offset).clip(0)
ndvi = (b08 - b04) / (b08 + b04 + 1e-6)
return ndvi
```



Figure 6. Additional examples from the MajorTOM-Core subset with seven spatiotemporal aligned modalities. Sentinel-2 L2A uses IRRG pseudo-coloring and Sentinel-1 RTC is visualized as VH-VV-VH. To account for their value ranges, VV is scaled from -30 - 5 db while VH is scaled from -40 - 0 db. Copernicus DEM is scaled based on the image value range with an additional 10 meter buffer.



Figure 7. Additional examples from the SSL4EO-S12 subset with seven spatiotemporal aligned modalities. Sentinel-2 L2A uses IRRG pseudo-coloring and Sentinel-1 RTC is visualized as VH-VV-VH. To account for their value ranges, VV is scaled from -30 - 5 db while VH is scaled from -40 - 0 db. Copernicus DEM is scaled based on the image value range with an additional 10 meter buffer.