12. DELTA: A Multimodal, Multitemporal Copernicus Dataset for Italian River Segmentation

Francesca Crovetto1,2 , Andrea Rapuzzi2, and Bianca Federici1

1 University of Genoa, DICCA - Department of Civil, Chemical and Environmental Engineering, Genoa, Italy bianca.federici@unige.it
2 A-SIGN S.r.l., Genoa, Italy francesca.crovetto@a-sign.it,andrea.rapuzzi@a-sign.it

Watercourse monitoring underpins land management, hydrogeological risk prevention and the assessment of climate-change impacts. Deep learning applied to Earth observation is a promising route to mapping river areas, yet its effectiveness is bounded by the extent, quality and representativeness of the training data, and no such resource exists for Italy, whose morphology, climate and hydrology vary sharply across a comparatively small territory. This paper introduces DELTA, a preliminary release of a multimodal and multitemporal dataset for the semantic segmentation of rivers at the national scale. DELTA brings together three Copernicus sources (Sentinel-2 multispectral optical imagery, Sentinel-1 synthetic aperture radar and the Copernicus Digital Elevation Model) co-registered on a national grid of 64 tiles of 100 km at 10 m ground sampling, with acquisitions spread over the four meteorological seasons so that hydrological and vegetation variability is represented. The binary river/non-river reference is obtained from the GRIT global river topology by a width-aware vectorisation and rasterisation procedure. We describe the tiling scheme, the automated selection and download pipeline, the generation of the reference masks, and the composition of the resulting collection (64 elevation, 250 optical and 498 radar rasters, plus 250 river masks; about 1.6 TB). We then examine the three issues that shape how the dataset should be used and outline the segmentation benchmarks planned for the full release. The dataset will be published under an open research licence consistent with the GRIT terms.