A Deep Learning Approach to Land Cover Estimation from Satellite Imagery

Erika Cerasti, Fabrizio De Fausti, Angela Pappagallo, Francesco Pugliese [1], Diego Zardetto [2]

Abstract

Timely and frequently updated Land Cover (LC) information is of primary importance to modern National Statistical Institutes (NSI). Since LC information need to be accurate and provided with a high spatial resolution, LC projects are very costly, with very complex production pipeline. Hence outputs are available at a rather low time frequency. Because of these reasons an automatic Land Cover (LC) estimation system of satellite images would be valuable. This paper presents an automated system based on deep learning algorithms to produce LC estimation according to the LC EuroSAT classification. The system takes Sentinel-2 satellite images as input to process data through a convolutional neural network (CNN) and a segmentation neural network (U-Net). Taking the LC EuroSAT dataset as a starting point, a suitable training dataset is built to the scope.

Keywords: land cover map, deep learning, remote sensing, pattern recognition

[1] Istat, erika.cerasti@istat.it, defausti@istat.it, angela.pappagallo@istat.it, frpuglie@istat.it

[2] World Bank, dzardetto@worldbank.org, Istat, zardetto@istat.it,