World Academy of Science, Engineering and Technology
International Journal of Geotechnical and Geological Engineering
Vol:14, No:04, 2020

# Investigation of Different Machine Learning Algorithms in Large-Scale Land Cover Mapping within the Google Earth Engine

**Authors :** Amin Naboureh, Ainong Li, Jinhu Bian, Guangbin Lei, Hamid Ebrahimy

**Abstract :** Large-scale land cover mapping has become a new challenge in land change and remote sensing field because of involving a big volume of data. Moreover, selecting the right classification method, especially when there are different types of landscapes in the study area is quite difficult. This paper is an attempt to compare the performance of different machine learning (ML) algorithms for generating a land cover map of the China-Central Asia–West Asia Corridor that is considered as one of the main parts of the Belt and Road Initiative project (BRI). The cloud-based Google Earth Engine (GEE) platform was used for generating a land cover map for the study area from Landsat-8 images (2017) by applying three frequently used ML algorithms including random forest (RF), support vector machine (SVM), and artificial neural network (ANN). The selected ML algorithms (RF, SVM, and ANN) were trained and tested using reference data obtained from MODIS yearly land cover product and very high-resolution satellite images. The finding of the study illustrated that among three frequently used ML algorithms, RF with 91% overall accuracy had the best result in producing a land cover map for the China-Central Asia–West Asia Corridor whereas ANN showed the worst result with 85% overall accuracy. The great performance of the GEE in applying different ML algorithms and handling huge volume of remotely sensed data in the present study showed that it could also help the researchers to generate reliable long-term land cover change maps. The finding of this research has great importance for decision-makers and BRI's authorities in strategic land use planning.

**Keywords :** land cover, google earth engine, machine learning, remote sensing
**Conference Title :** ICRSIAGCR 2020 : International Conference on Remote Sensing, Image Analysis, Geometric Corrections and Registration
**Conference Location :** New York, United States
**Conference Dates :** April 23-24, 2020

Open Science Index, Geotechnical and Geological Engineering Vol:14, No:04, 2020 publications.waset.org/abstracts/112348.pdf