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Title: Land Use Land Cover Mapping By Time-Weighted Dynamic Time Warping With Implementation in Python

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Abstract: In this Thesis I have described about land cover and land usage in form of maps which calculates change in land cover area yearly. This all started as we were observing the change in the land cover through satellite images but this time series of satellite imagery were just some raw data so we have to process and use some algorithms on this time series data to classify and detect changes in the land cover area. So to process this time series data we pre-process it first, to get a sorted data with corrections for this task we applied this pre processing algorithms over the satellite imagery. After getting this sorted data we want to classify all of the land covering and for this we used "TWDTW" algorithm given by 'Victor Maus' in 2016 which we have modified in form of functions to be ready as a package of library in python. The classification that we did were mainly 'Vegetation', 'Plants', 'Urban Area' and 'Water' for the land covering classification and to do this we use many indexes (EVI, EVI2, GNDVI) but we have focus on "NDVI" vegetation index because this index is widely used to classify vegetation and forest but we need to process this data through "TWDTW" algorithm to simulate time series data of the above vegetation indexes. To improve the accuracy of "TWDTW" algorithm we have used gradient boosting, random forest and K-neighbour machine learning algorithms which eventually in the last gives us an accuracy upto 94%. Finally we were able to classify and detect changes in land cover area by using all of this above algorithm which we have shown in detail in this Thesis with a good accuracy result

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