Land use and land cover classification of satellite image time series using machine learning

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The human activities are impacting the global environment and the Earth surface. Research on new technologies to assess and monitor this impact is a necessary task to improve our knowledge on Earth system dynamics. One way to understand the environmental changes is to look to land cover and land use changes. In the past few decades, the Earth surface imaging done by orbital sensors is the most consistent way to do this task globally and periodically. Nowadays, the planet is continuously monitored and a several imagery databases are open to the public community. This massive volume of spatio-temporal suggested the concept of big Earth Observation data that, associated with the recent innovations on information technologies and connectivity, increased the attention to the Earth Observation data cubes (EODC) (Strobl, 2017; Giuliani et al., 2019). More than a way to organize multidimensional data, an EODC can be viewed as a package of solutions intended to facilitate its consumption by researchers. Recently, some private and governmental initiatives by research groups and institutions worldwide are producing and delivering EODC. INPE, the National Institute for Space Research in Brazil, is working on a challenging project, organize and deliver the Brazilian Data Cube (BDC) (INPE, 2019). Here, we present a work in progress model of the BDC catalog database using the Unified Modeling Language (UML) to clarifies some concepts and propose its Entity-Relationship model. The BDC catalog database is a central component of the data cube technology. It enables the search and retrieval of its data elements and facilitates the interoperability between services and client softwares.