Satsense: an open source Python library for land-use and land-cover classification using earth observation data

Bouwe Andela (1), Berend Weel (1), Elena Ranguelova (1), Niels Drost (1), Maximilian Filtenborg (2), Derk Barten (2), Debraj Roy (2), and Mike Lees (2)

(1) Netherlands eScience Center, Netherlands, (2) University of Amsterdam, Netherlands

Satsense is an open source Python library for patch based land-use and land-cover classification, initially developed for a project on deprived neighborhood detection. However, many of the algorithms made available through Satsense can be applied in other domains, such as ecology and climate science.

Detection of deprived neighborhoods is a land-use classification problem that is traditionally solved using hand crafted features like HoG, Lacunarity, NDXI, Pantex, Texton, and SIFT, computed from very high resolution satellite images. One of the goals of Satsense is to facilitate assessing the performance of these features on practical applications. To achieve this Satsense provides an easy to use open source reference implementation for these and other features, as well as facilities to distribute feature computation over multiple cpu's. In the future the library will also provide easy access to metrics for assessing algorithm performance.

Satsense is based on readily available open source libraries, such as opencv for machine learning and the rasterio/gdal and netcdf libraries for data access. It has a modular design that makes it easy to add your own hand-crafted feature or use deep learning instead.