i3: OBIA4RTM – Object-based vegetation parameter retrieval using Radiative Transfer Modelling

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Project idea:

Radiative transfer models of vegetation (RTM) provide – through their underlying physical equations - a time and space invariant approach for retrieving plant parameters with considerably high accuracy from optical remotely sensed imagery, however, mostly on a pixel-based approach. Pixel-based approaches, however, lack from several drawbacks including a higher sensitivity to noise inherent in the satellite data and might not represent spatial inhomogeneities present in plant canopies adequately.

The idea of the project is therefore to develop a open-source solution to combine RTM with object-based (OBIA) methods implemented in Python and PostgreSQL called OBIA4RTM and to apply the tool to an agricultural region in Southern Germany where in-situ data of leaf area index – a very important plant parameter – is available.

The combined usage of OBIA and RTM helps to tackle the needs of local authorities as evidenced from previous projects with the state of Bavaria and provide more meaningful spatial results on plant development relevant for smart farming applications and food security monitoring.

Keywords

OBIA, Radiative Transfer Modelling, Spatial Databases, Smart Agriculture