Re-invent remote sensing by using deep learning

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Remote sensing has been contributed to the nondestructive observations of the earth surface. Remote sensing can cover large areas with homogeneous observation. However, essentially, the conventional remote sensing technique was zero-dimensional, where spatial information such as textures of the earth surface was neglected.

Machine learning using deep neural networks (DNN) is the powerful tool for detecting objects, such as human faces, cars, dogs, etc. However, DNN has not been widely utilized to identify amorphous objects such as vegetation types in remotely sensed data.

In this study, using DNN, the method to classify vegetation types has been developed. The newly introduced method “chopped picture method” showed a good performance for classification of earth surfaces according to vegetation types, such as orchards, bamboo stands, etc. This can be the re-invention of remote sensing, because we now have a method to tap onto the rich information, the two-dimensional spatial information, in remotely sensed data.

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