

CLASSIFICATION OF URBAN AREAS USING GAOFEN-3 SAR DATA BY LIGHTGBM

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Keywords: remote sensing, image classification, ensemble learning

This study investigates the effectiveness of PauliRGB decomposition of Gaofen-3 data for the classification of urban areas using LightGBM (light gradient boosting machines) and Random Forest (RF). The new generation ensemble learning algorithms such as LightGBM and XGBoost gained great attention in remote sensing due to their higher performance compared to state-of-art algorithms (RF, support vector machines etc.) in terms of accuracy and computation time. In this study, classification of the urban areas using Gaofen-3 SAR data (PauliRGB decomposition) for the study area of San Francisco was assessed using LightGBM and RF classification. There are six land cover classes in the study area: mountain, water, vegetation, high-density urban, low-density urban and developed urban. The classification performance of algorithms was compared in terms of overall accuracy and computation time. The experimental results show that LightGBM received higher accuracy (72.64%) than RF (69.29%) in terms of overall accuracy. The result also indicates the faster training speed and lower memory usage of LightGBM compared to RF.