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Artificial terraced field extraction based on high resolution DEMs

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With the increase of human activities, artificial landforms become one of the main terrain features with special geographical and hydrological value. Terraced field, as the most important artificial landscapes of the loess plateau, plays an important role in conserving soil and water. With the development of digital terrain analysis (DTA), there is a current and future need in developing a robust, repeatable and cost-effective research methodology for terraced fields. In this paper, a novel method using bidirectional DEM shaded relief is proposed for terraced field identification based on high resolution DEM, taking Zhifanggou watershed, Shannxi province as the study area. Firstly, 1m DEM is obtained by low altitude aerial photogrammetry using Unmanned Aerial Vehicle (UAV), and 0.1m DOM is also obtained as the test data. Then, the positive and negative terrain segmentation is done to acquire the area of terraced field. Finally, a bidirectional DEM shaded relief is simulated to extract the ridges of each terraced field stages. The method in this paper can get not only polygon feature of the terraced field areas but also line feature of terraced field ridges. The accuracy is 89.7% compared with the artificial interpretation result from DOM. And additional experiment shows that this method has a strong robustness as well as high accuracy.