Mathematical Morphology and Remote Sensing

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ABSTRACT

An algebraic system of operators, such as those of mathematical morphology, is useful for remote sensing image interpretation because compositions of its operators can be formed which, when acting on complex shapes, are able to decompose them into their meaningful parts and separate the meaningful parts from their extraneous parts. Such a system of operators and their compositions permit the underlying shapes to be identified and reconstructed as best possible from their distorted noisy forms. As well they permit each shape to be understood in terms of a decomposition, each entity of the decomposition being some suitably simple shape.

Since shape is a prime carrier of the spectral information held in remote sensing imagery, there should be little surprise about the importance of mathematical morphology. Morphological operations can simplify image data preserving their essential shape characteristics and eliminate irrelevancies. As the identification and decomposition of objects and surfaces, correlate directly with shape, it is only natural that mathematical morphology has an essential structural role to play in remote sensing image interpretation by computers.