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Nota di contenuto	Essential Image Processing and GIS for Remote Sensing; Contents; Overview of the Book; Part One: Image Processing; 1 Digital Image and Display; 1.1 What is a digital image?; 1.2 Digital image display; 1.2.1 Monochromatic display; 1.2.2 Tristimulus colour theory and RGB colour display; 1.2.3 Pseudo colour display; 1.3 Some key points; Questions; 2 Point Operations (Contrast Enhancement); 2.1 Histogram modification and lookup table; 2.2 Linear contrast enhancement; 2.2.1 Derivation of a linear function from two points; 2.3 Logarithmic and exponential contrast enhancement 2.3.1 Logarithmic contrast enhancement2.3.2 Exponential contrast enhancement; 2.4 Histogram equalization; 2.5 Histogram matching and

Gaussian stretch; 2.6 Balance contrast enhancement technique; 2.6.1 *Derivation of coefficients, a, b and c for a BCET parabolic function; 2.7 Clipping in contrast enhancement; 2.8 Tips for interactive contrast enhancement; Questions; 3 Algebraic Operations (Multi-image Point Operations); 3.1 Image addition; 3.2 Image subtraction (differencing); 3.3 Image multiplication; 3.4 Image division (ratio); 3.5 Index derivation and supervised enhancement
3.5.1 Vegetation indices3.5.2 Iron oxide ratio index; 3.5.3 TM clay (hydrated) mineral ratio index; 3.6 Standardization and logarithmic residual; 3.7 Simulated reflectance; 3.7.1 Analysis of solar radiation balance and simulated irradiance; 3.7.2 Simulated spectral reflectance image; 3.7.3 Calculation of weights; 3.7.4 Example: ATM simulated reflectance colour composite; 3.7.5 Comparison with ratio and logarithmic residual techniques; 3.8 Summary; Questions; 4 Filtering and Neighbourhood Processing; 4.1 Fourier transform: understanding filtering in image frequency
4.2 Concepts of convolution for image filtering4.3 Low-pass filters (smoothing); 4.3.1 Gaussian filter; 4.3.2 The k nearest mean filter; 4.3.3 Median filter; 4.3.4 Adaptive median filter; 4.3.5 The k nearest median filter; 4.3.6 Mode (majority) filter; 4.3.7 Conditional smoothing filters; 4.4 High-pass filters (edge enhancement); 4.4.1 Gradient filters; 4.4.2 Laplacian filters; 4.4.3 Edge-sharpening filters; 4.5 Local contrast enhancement; 4.6 *FFT selective and adaptive filtering; 4.6.1 FFT selective filtering; 4.6.2 FFT adaptive filtering; 4.7 Summary; Questions; 5 RGB-IHS Transformation
5.1 Colour coordinate transformation5.2 IHS decorrelation stretch; 5.3 Direct decorrelation stretch technique; 5.4 Hue RGB colour composites; 5.5 *Derivation of RGB-IHS and IHS-RGB transformations based on 3D geometry of the RGB colour cube; 5.5.1 Derivation of RGB-IHS Transformation; 5.5.2 Derivation of IHS-RGB transformation; 5.6 *Mathematical proof of DDS and its properties; 5.6.1 Mathematical proof of DDS; 5.6.2 The properties of DDS; 5.7 Summary; Questions; 6 Image Fusion Techniques; 6.1 RGB-IHS transformation as a tool for data fusion; 6.2 Brovey transform (intensity modulation)
6.3 Smoothing-filter-based intensity modulation

Sommario/riassunto

Essential Image Processing and GIS for Remote Sensing is an accessible overview of the subject and successfully draws together these three key areas in a balanced and comprehensive manner. The book provides an overview of essential techniques and a selection of key case studies in a variety of application areas. Key concepts and ideas are introduced in a clear and logical manner and described through the provision of numerous relevant conceptual illustrations. Mathematical detail is kept to a minimum and only referred to where necessary for ease of understanding. Such concepts are exp