

Contents

1	Introduction	1
1.1	Literature Review on Change Detection in Satellite Images	1
1.2	Layout of the Study	4
	References	5
2	Pixel-Based Change Detection Methods	7
2.1	Image Differencing	7
2.2	Image Rationing	11
2.3	Image Regression	12
2.4	Change Vector Analysis	14
2.5	Median Filtering-Based Background Formation	16
2.6	Pixelwise Fuzzy XOR Operator	17
	References	21
3	Transformation-Based Change Detection Methods	23
3.1	Principal Component Analysis	23
3.2	Kauth-Thomas Transformation	26
3.3	Vegetation Index Differencing	27
3.4	Time-Dependent Vegetation Indices	29
3.5	Color Invariants	30
	References	33
4	Texture Analysis Based Change Detection Methods	35
4.1	Gray Level Co-occurrence Matrix	35
4.2	Entropy	38
	References	39
5	Structure-Based Change Detection Methods	41
5.1	Edge Detection	41
5.2	Gradient-Magnitude-Based Support Regions	42

5.3	Matched Filtering	42
5.4	Mean Shift Segmentation	43
5.5	Local Features.	45
5.6	Graph Matching	46
5.7	Shadow Information.	48
	References	51
6	Fusion of Change Detection Methods	53
6.1	Fusion Methodology	53
6.2	Category Level Fusion	54
6.3	Inter-Category Level Fusion	54
7	Experiments	57
7.1	The Data Set.	57
7.2	Performance Tests	57
7.2.1	Pixel-Based Change Detection Methods.	61
7.2.2	Transformation Based Change Detection Methods	62
7.2.3	Texture-Based Change Detection Methods.	62
7.2.4	Comparison of Thresholding Algorithms	63
7.2.5	Structure-Based Change Detection Methods	65
7.2.6	Fusion of Change Detection Methods	68
	References	70
8	Final Comments.	71

Two-Dimensional Change Detection Methods

Remote Sensing Applications

İlsever, M.; Unsalan, C.

2012, X, 72 p. 48 illus., 22 illus. in color., Softcover

ISBN: 978-1-4471-4254-6