

Contents

Introduction	1
Review of Literature	28
1 Preliminaries	36
1.1 Closed and Open sets	36
1.2 Separation Axioms	38
1.3 Functions	39
1.4 Fuzzy Topological Spaces	42
2 λ_g^δ-Closed Sets in Topological Spaces	45
2.1 Introduction	45
2.2 λ_g^δ -closed sets and their properties	46
2.3 Characterizations of λ_g^δ -closed sets	53
2.4 λ_g^δ -Open Sets	55
2.5 λ_g^δ -closure and λ_g^δ -interior	58
3 Other Notions Related to λ_g^δ-Closed Sets	61
3.1 Introduction	61
3.2 λ_g^δ -Neighborhood	61
3.3 λ_g^δ - Frontier	66
3.4 λ_g^δ -Boundary, λ_g^δ -Exterior, λ_g^δ -Saturated Set	68
3.5 λ_g^δ -open sets via grill	71

4	Associated Spaces using λ_g^δ-closed sets	76
4.1	Intoduction	76
4.2	Separation Spaces	76
4.3	Relationship between the newly introduced spaces and some of the existing spaces	80
5	Continuity Concepts using λ_g^δ-closed sets	85
5.1	Introduction	85
5.2	λ_g^δ -continuity	85
5.3	λ_g^δ -continuity via Separation Spaces	91
5.4	Quasi λ_g^δ -continuity and Perfectly λ_g^δ -continuity	92
5.5	Totally λ_g^δ -continuity, Strongly λ_g^δ -continuity and Contra λ_g^δ -continuity	95
5.6	λ_g^δ -irresoluteness and contra λ_g^δ -irresoluteness	100
6	λ_g^δ-homeomorphism	103
6.1	Introduction	103
6.2	λ_g^δ -open and λ_g^δ -closed functions	103
6.3	λ_g^δ -homeomorphism and $\lambda_g^{\delta*}$ -homeomorphism	108
7	Separation Axioms using λ_g^δ-closed sets	111
7.1	Introduction	111
7.2	Behaviour of λ_g^δ -closed sets under δ - T_i , $i = 0, 1, 2$ Axioms	111
7.3	Separation Axioms	113
7.4	λ_g^δ -compactness and λ_g^δ -connectedness	116
7.5	λ_g^δ -Lindelof	123
7.6	$\lambda_g^\delta G_i$ - Axioms	124
8	Application of λ_g^δ-closed sets in image processing	127
8.1	Introduction	127
8.2	Methodology	129
8.2.1	Facial Feature Extraction	129
8.3	Working Strategy	129

8.3.1	Training	130
8.3.2	Testing	131
8.4	Experimental results	132
8.5	Results	138
8.6	Conclusion	141
9	Fuzzy λ_g^δ-closed sets in Fuzzy Topological Spaces	142
9.1	Introduction	142
9.2	Fuzzy Λ_δ -sets and Fuzzy V_δ -sets	142
9.3	Fuzzy (Λ, δ) -closed sets in fuzzy topological spaces	146
9.4	Fuzzy λ_g^δ -closed sets	150
9.5	$F\lambda_g^\delta$ -open sets	153
9.6	$F\lambda_g^\delta$ -closure and $F\lambda_g^\delta$ -interior	155
9.7	Somewhat Fuzzy λ_g^δ -continuous function	157
	Summary and Conclusion	160
	Bibliography	162
	Appendix I	169
	Appendix II	178
	Publications	197