

CONTENTS

CHAPTER NOS.	TITLES	PAGE NOS.
1	INTRODUCTION	1
	1.1 Growth of Cervical Cancer	3
	1.2 Screening and Diagnosis Methods Involved in Precancerous Detection	6
	1.3 Cervical Cancer Screening Approaches Process for Tribes in Sub-Saharan Africa and Asia	17
	1.4 Cervical Cancer Examination Approach used in the Developed Nations	19
	1.5. The Promise of Smart Colposcopy	23
	1.6 Technical Challenges Faced in Smart Colposcopy Images:	26
	1.7 Statement of Research Problem	27
	1.8 Objective of this Research Work	28
	1.9 Significance of Research	29
	1.10 Research Gap	30
	1.11. The Rationale of the Study	30
	1.12 Data Collection & Ground Truth Labeling	31
	1.13 Chapter Organization	33
2	LITERATURE REVIEW	37
	2.1 Searching Strategies	38
	2.2 Specular Reflection Detection using Color Space Method	40
	2.3 Deep Learning Segmentation Model using the Binary Masking	47
	2.4 Deep Learning inpainting model for missing region	52
	2.5 Image Classification for using Deep learning Classification Models	61
	2.6 Summary	68

CHAPTER NOS.	TITLES	PAGE NOS.
3	RESEARCH METHODOLOGY	69
	3.1 Research Design	69
	3.2 Phase I - Specular Reflection Identification	70
	3.3 Phase II – Segmentation of Specular Reflection	72
	3.4 Phase III: Inpainting for Image Enhancement	73
	3.5 Phase IV: Enhanced Image Grading	74
	3.6 Summary	75
4	SPECULAR REFLECTION IDENTIFICATION	77
	4.1 Existing Method for the Identification of Specular Reflection on Colposcopy using Color Space	77
	4.2 Outline of the Method Proposed	84
	4.3 Qualitative Analysis	98
	4.4 Quantitative Evaluation	104
	4.5 Implementation of Specular Reflection Detection on Other Digital Medical Images	106
	4.6 Summary	107
5	SEGMENTATION OF SPECULAR REFLECTION	108
	5.1 Overview of this Chapter	108
	5.2 Binary Masking	109
	5.3 CNN Based Segmentation Models	111
	5.4 Experimental Results and Discussion	120
	5.5 Segmentation of Specular Reflection on the Smart Colposcopy Images using Different Versions of UNet Model	127
	5.6 U-Net++ Fine-Tuned for SR Segmentation	131
	5.7 Experimental Results and Discussion	132
	5.8 Summary	138

CHAPTER NOS.	TITLES	PAGE NOS.
6	INPAINTING FOR IMAGE ENHANCEMENT	140
6.1	Convolutional Neural Network Models for the Filling up the Eliminated reflection region on Smart Colposcopy Images	140
6.2	Overview of the Proposed Method	148
6.3	Result and Discussion	155
6.4	Summary	173
7	ENHANCED IMAGE GRADING	174
7.1	Overview of this Chapter	174
7.2	Training CNN Classification Model for Grading of Smart Colposcopy Image	176
7.3	Experimental Results and Discussion	182
7.4	Summary	195
8	CONCLUSION AND FUTURE WORK	196
9	SUMMARY OF RESEARCH CONTRIBUTION	199
	REFERENCES	201
	PUBLICATIONS RELATED TO THE RESEARCH WORK	219
	PLAGIARISM REPORT	