

TABLE OF CONTENTS

CERTIFICATE	iii
DECLARATION BY THE CANDIDATE	v
COPYRIGHT TRANSFER CERTIFICATE	vii
Acknowledgements	ix
Table of Contents	xi
List of Figures	xiii
List of Tables	xv
List of Abbreviations	xvii
List of Symbols	xix
PREFACE	xxi
Chapter 1 : Introduction	1
1.1. Introduction.....	1
1.2. Overview of MRI.....	1
1.3. Motivation of the work	5
1.4. Objective of the Thesis	7
1.5. Contributions to the Thesis	8
1.6. Outline of the Thesis.....	9
Chapter 2 : Theoretical Background	11
2.1. Introduction.....	11
2.2. Noise patterns in MR images.....	13
2.3. Literature Survey of MRI restoration and enhancement methods.....	16
2.3.1. Filtering approach	17
2.3.2. Transform domain approach.....	21
2.3.3. Statistical approach.....	23
2.4. Dataset Description.....	29
2.5. Performance Measures	30
2.6. Conclusions.....	32
Chapter 3 : Design and development of nonlinear PDE based filters for restoration and enhancement of MR images	33
3.1. Introduction.....	33
3.2. Background.....	35
3.3. An efficient PDE-Based nonlinear filter adapted to Rician noise for restoration and enhancement of magnetic resonance images	36
3.3.1. Methods and Models.....	37

3.3.2. Results and discussions	40
3.4. Modified complex diffusion based nonlinear filter for restoration and enhancement of magnetic resonance images.....	48
3.4.1. Methods and Models	48
3.4.2. Results and discussions	51
3.5. Conclusions	59
Chapter 4 : Orientation Dependent Anisotropic Adaptive Fuzzy Diffusion Based Filter For Restoration And Enhancement Of MRI.....	61
4.1. Introduction	61
4.2. Background	64
4.3. Method and Models.....	66
4.4. Results and Discussion.....	72
4.5. Conclusions	78
Chapter 5 : A PDE-based general framework adapted to Rayleigh's, Rician's and Gaussian's distributed noise for restoration and enhancement of magnetic resonance images	79
5.1. Introduction	79
5.2. Related work	81
5.3. Method and Models.....	83
5.4. Results and Discussion.....	90
5.5. Conclusions	100
Chapter 6 : Conclusion and Future Work	101
6.1. Conclusions	101
6.2. Suggestions for Future Research.....	103
References	105
List of Papers Published /Presented /Communicated	116