Table of Contents

hapter	Name Introduction		
1			
2	Fundamental of Neural Networks	4	
	2.1 Processing Unit	5	
	2.2 Combination function	6	
	2.3 Activation Function	7	
	2.4 Network Topologies	10	
	2.5 Network Learning	11	
3	2.6 Objective Functions Neural Networks Learning Rules	12 14 16	
	3.1 Hebbian Learning Rule	17	
	3.2 Perceptron Learning Rule	18	
	3.3 Delta Learning Rule		
	3.4 Windrow-Hoff Learning Rule	20	
	3.5 Correlation Learning Rule	20	
	3.6 Winner-Take-All Learning Rule	21	
4	3.7 Outstar Learning Rule Feed-Forward Neural Networks	22	
	4.4 Pagia Arabitactura	24	
	4.1 Basic Architecture	26	
	4.2 Representation Capability	27	
	4.3 Network Structure Design	30	
5	4.4 Back-Propagation	36	
	Optimization Algorithms		

	5.1	Faster Training	31
	5.2	Variable Learning Rate	38
	5.3	Conjugate Gradient Algorithms	40
	5.4	Quasi-Newton Algorithms	42
	5.5	Levenberg-Marquardt	43
6	Field	d-Oriented Control of Induction Motors	46
	6.1	Electrical machines, an overview	46
	6.2	DC-Motors	47
			47
	6.3	AC-motors	49
	6.4	Mathematical model of the field oriented induction motor	
	6.5	Vector control system	55
7	ANI	N Controller and Speed Estimator	57
	7.1	Control systems	57
			65
	7.2	Speed Estimator	
8	Hai	rdware implementation	72

Future work

References