

TABLE OF CONTENTS

	Page
List of Tables	ix
List of Figures	xi
1 Introduction	1
1.1 Cognitive Radio Network	1
1.2 Motivation	4
1.3 Problem Definition	5
2 Literature Survey and Related Works	7
2.1 Overview of Data Dissemination and its Challenges	7
2.2 Channel Selection strategy in multi-hop CRAHNS	7
2.3 Broadcast Scheduling Problems	8
3 System Model and Assumptions	9
3.1 Network Model	9
3.2 Spectrum Sensing Activity	9
3.3 Primary Radio Activity Model	10
3.3.1 Long Term PR Activity	11
3.3.2 High PR Activity	11
3.3.3 Low PR Activity	12
3.3.4 Normal PR Activity	12
4 Proposed Model	13
4.1 Neighbour Discovery	13
4.2 Channel Usability	13
4.3 Channel Selection Scheme for The Proposed Model	14
4.3.1 Ranking of Channel	15
4.4 Distributed Data Dissemination Schedule for The Proposed Model	15
4.4.1 PseudoCode for Algorithm 1	18
4.4.2 PseudoCode for Algorithm 2	18

TABLE OF CONTENTS.

5	Simulation Results and Observations	19
5.1	Implementation Setup	19
5.2	Simulation Environment	20
5.3	DDDP Simulation Results	20
6	Conclusion and Future Works	23
	Bibliography	25

LIST OF TABLES

TABLE	Page
4.1 Notation Used in the data dissemination schedule	17

LIST OF FIGURES

FIGURE	Page
1.1 Usage of frequency Spectrum	2
1.2 Illustration of white space in frequency spectrum.	2
1.3 An illustration of Cognitive Cycle in CR Node.	3
1.4 An illustration of Cognitive radio network Architecture.	4
3.1 Activity Model: Alternating ON/OFF Markov Renewal Process for PR activity	10
3.2 Illustration of Long PR Activity	11
3.3 Illustration of High PR Activity	11
3.4 Illustration of Low PR Activity	12
3.5 Illustration of Normal PR Activity	12
4.1 SUs in MHACRN and sender A's neighbors within its communication range	16
4.2 SU A disseminate the message on its selected channel2	16
4.3 SU B perform next hop dissemination on its selected channel1	17
5.1 High level design of CRCN Patch with Primary Radio Activity Model	20
5.2 Comparison of percentage of message receive by SUs in DDDP and SURF	21
5.3 Comparison of HIR for DDDP and SURF	21
5.4 Average Delivery Ratio under different PR activity	22
5.5 Increase in reduction of Broadcast Redundancy with increasing number of SUs	22