

# Table of contents

<b>List of Abbreviations</b>	<b>xiii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Background . . . . .	1
1.2 Problem Formulation . . . . .	9
1.3 Objectives and Thesis Scope . . . . .	10
1.4 Related Work . . . . .	11
1.5 Outline of the Thesis and Main Contributions . . . . .	14
1.6 List of Publications . . . . .	18
<b>2 Diversity Techniques</b>	<b>23</b>
2.1 FEC and Interleaving . . . . .	23
2.2 Multiple Antennas . . . . .	30
2.3 Rotated Constellations . . . . .	34
2.4 Time Diversity Techniques . . . . .	35
2.5 Frequency Diversity Techniques . . . . .	44
2.6 Space Diversity Techniques . . . . .	47
2.7 Conclusions . . . . .	52
<b>3 Information-Theoretic Investigation of Diversity Techniques</b>	<b>55</b>
3.1 Capacity of Fading Channels . . . . .	56
3.2 Time, Frequency and Space Diversity . . . . .	59
3.3 Rotated Constellations . . . . .	68
3.4 Conclusions . . . . .	72
<b>4 Combined Diversity in Current Systems</b>	<b>75</b>
4.1 Combined Space and Time Diversity in DVB-T . . . . .	77
4.2 Combined Space and Time Diversity in DVB-T2 . . . . .	88
4.3 Performance Comparison between DVB-T and DVB-T2 . . . . .	105
4.4 Conclusions . . . . .	106

## TABLE OF CONTENTS

---

<b>5</b>	<b>Combined Diversity in Next Generation Systems</b>	<b>109</b>
5.1	Time Diversity . . . . .	110
5.2	Frequency Diversity . . . . .	120
5.3	Space Diversity . . . . .	122
5.4	Combined Diversity . . . . .	125
5.5	Rotated Constellations . . . . .	126
5.6	Conclusions . . . . .	132
<b>6</b>	<b>Design Guidelines and Conclusions</b>	<b>135</b>
6.1	Concluding Remarks . . . . .	135
6.2	Recommendations . . . . .	139
6.3	Future Research Topics . . . . .	142
	<b>References</b>	<b>145</b>