

CONTENTS

- 1 Introduction 5**
 - 1.1 Introduction and Research Motivation 5
 - 1.2 Outlining 5G Vision 5
 - 1.3 5G Technology Components 8
 - 1.3.1 Extreme Network Densification 8
 - 1.3.2 Advanced Spectrum Sharing and Interference Management 8
 - 1.3.3 Converged Radio Networks and Direct Communications 9
 - 1.3.4 Utilization of Extremely High Frequency Spectrum 10
 - 1.3.5 Massive MIMO 10
 - 1.3.6 Network Virtualization and Cloud-based Networking 11
 - 1.3.7 Energy Efficient Communications 11
 - 1.4 Scope of the Thesis 12

- 2 5G Wireless Network Enablers 13**
 - 2.1 General Background 13
 - 2.2 Author's Focus and Contribution 13
 - 2.2.1 Transmission Power Control in Cellular Access Networks 14
 - 2.2.2 Performance Evaluation of Mobile Data Offloading 14
 - 2.2.3 Network-assisted Direct Communication between Users in Proximity 15

- 3 Emerging IoT Paradigm 19**
 - 3.1 General Background 19
 - 3.2 Author's Focus and Contribution 21
 - 3.2.1 Key Design Principles of Home Automation Gateway 21
 - 3.2.2 Communication Technologies in 5G-IoT Applications 23
 - 3.2.3 Evaluation of Cryptographic Primitives for IoT Devices 24

- 4 User Experience and Adoption of Future Mobile Services 26**
 - 4.1 General Background 26
 - 4.2 Author's Focus and Contribution 27
 - 4.2.1 Modelling User Satisfaction with Mobile Web Services 27
 - 4.2.2 Understanding Mobile YouTube Quality Expectations 29

- 5 Conclusion 34**

- Bibliography 35**

- Abstract 41**