

# Co-Channel Interference in Bluetooth™ Piconets

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## ABSTRACT

Bluetooth™ is an emerging short-range RF wireless voice and data communication technology expected to spread widely in a couple of years. The open specification technology eliminates the need for cables to connect mobile phones, portable computers and countless other devices to each other from all different manufacturers.

This thesis provides an overview of the emerging Bluetooth™ technology and investigates the performance of Bluetooth™ data networks in various network topologies simulated from actual usage scenarios. Using a typical office environment, the study examines the probability and effects of Co-Channel interference as Bluetooth™ ad-hoc networks are formed in adjacent offices. A computer aided simulation tool, MATLAB simulates a low to highly dense interfering Bluetooth™ environment which provides the parameters to evaluate the bluetooth co-channel interference and performance. Several metrics are identified to predict Bluetooth™ performance in a piconet after a collision has occurred: data through put, the probability of frequency collision, transmitter – receiver distance, and power received. Next, to predict Bluetooth performance we also need to define what constitutes a lost packet. Finally, a Bluetooth™ network simulation is developed to measure the metrics, given occurrence of the lost packets.

## **ACKNOWLEDGEMENT**

I am deeply indebted to Dr. Brian Woerner who besides being an excellent advisor has been a steadfast source of encouragement during my thesis work. I am very grateful.

I am grateful to Dr. Ira Jacobs who provided constant encouragement each time I contacted him for advice and suggestions in his review of this report. I would also like to express my gratitude for Dr. Wayne Scales for his support and willingness to sit on my thesis committee in short notice. I am also thankful for the support from the IBM management team to provide time off during the work week to complete the thesis work.

Throughout my education I have relied on the love and support of my parents – Daniela and James, and my older sister Adrienne. I am truly blessed in that they have supported me in every way. I also acknowledge my friends who have been a constant beacon of support. My little “Piconets”; Jamel, Daniel, and Jordan, the source of my inspiration.

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