

Wireless Communication and Network Systems

Term Project (OFDM Implementation on SDR)

Group C

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1 Introduction

In this project we implemented OFDM technique on bladeRF SDR. Final software stack is provided with this document. In this document we proposed a single experiment result and we discuss about future experiments that are going to be presented in the final report of the project.

Table 1: Experiment Parameters and Results

Parameters	Experiment 1	Experiment 2	Experiment 3
Number of Sub-carriers	64	64	64
Cyclic Prefix Length	16	16	16
Taper Length	4	4	4
Payload Length	256	100	100
Modulation Scheme	QAM4	QAM4	QAM4
Inner FEC	None	None	None
Outer FEC	HAMMING 128	HAMMING 128	SECDED 2216
Sleep Rate*	100msec.	100msec.	100msec.
Total Data Frames Sent	1001	1001	1001
μ of Data Frames Caught	594.6	789.1	785.3
σ^2 of Data Frames Caught	428.044	355.8778	238.011

2 Conducted Experiment

Parameters that are used in this experiment are given in Table 1. Details of experimental study is as follows; each case is repeated ten times, distance between two bladeRF devices is 49 cm. Box plot of the experiment is given in Figure 1. From the results shown in Table 1 we clearly see that, longer frames produce low packet rates, in order to investigate the effect of forward error

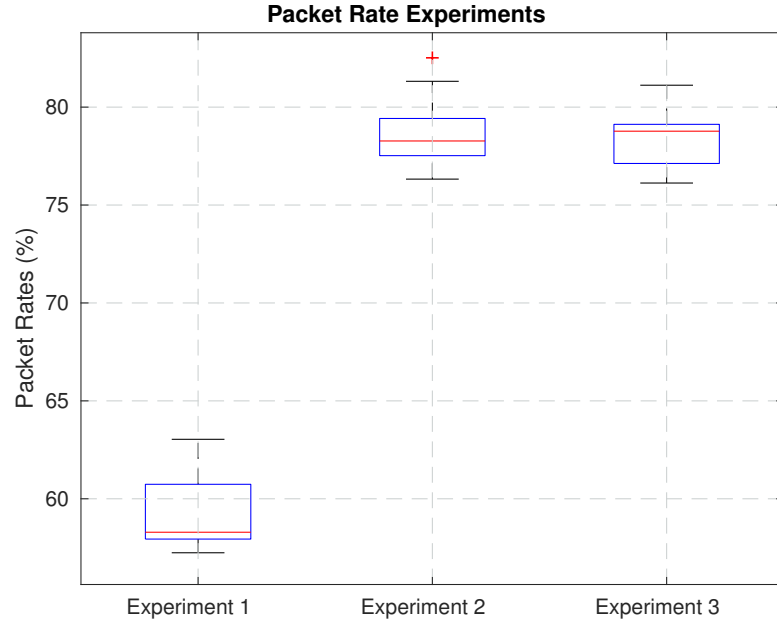


Figure 1: Box Plot of Experiments with Parameters Given in Table 1

coding methodology, we used SECDED 2216 forward error coding method. We get most stable results in Experiment 3 with small difference between the mean value of successfully caught data frames in Experiment 2.

Future experiments are going to include effects of number of sub-carriers, cyclic-prefix length, taper length, payload length, modulation scheme, FEC and sleep rate on not only packet rates but also BER values, throughput and RSSI values.