

# LAB 1: INTRODUCTION TO LabVIEW

## I. OVERVIEW

The objective of this laboratory session is to introduce the basics of LabVIEW software by generating a random bit sequence and then calculating the Bit Error Rate (BER) of the received sequence using Virtual Instruments (VIs). Source VI that generates the random bit sequence represents the transmitter, and error detection VI that calculates BER represents the receiver.

### PART 1: RANDOM BIT SEQUENCE GENERATION

In the first part of this lab, we build a source VI that is capable of generating a random bit sequence to be transmitted. In our generation scheme, we set the packet length as input. Then, random bit sequences of this length are generated as output bit stream using the algorithm detailed in II. Lab document. A representation of this process is shown in Fig. 1 below:



Fig. 1 – A representation of the random bit sequence generation process

### PART 2: ERROR DETECTION

In the second part of this lab, we build an error detection VI that is capable of calculating the BER of the received random bit sequence generated by our source. In our detection scheme, we use *key bit sequence* and *input bit sequence* as inputs. Then, compare them in order to calculate Hamming distance and finally calculate the bit error rate as output using the algorithm detailed in II. Lab document. A representation of this process is shown in Fig. 2 below:

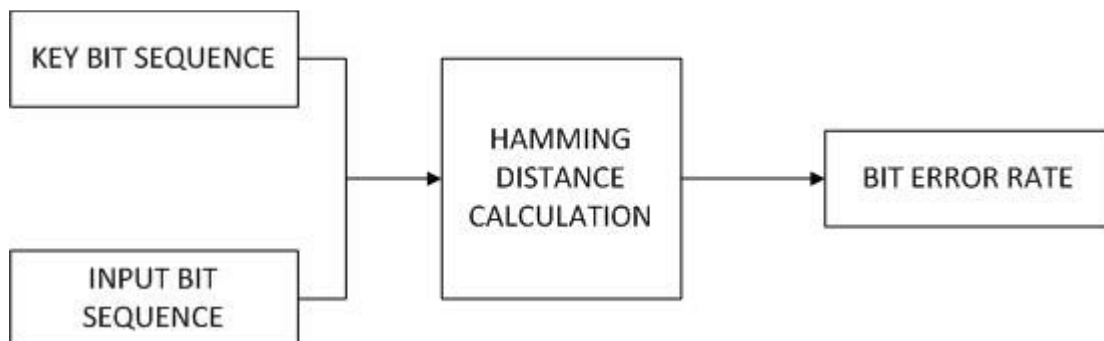


Fig. 2 – A representation of the error detection process