ABSTRACK

The implementation of Vehicle-to-Vehicle (V2V) communication can be applied to medical transportation, such as ambulances. This can be achieved by sending image information to nearby vehicles to clear the way. Challenges include the Doppler effect from vehicle movement, causing Intercarrier Interference (ICI), and propagation fading causing Intersymbol Interference (ISI). This study simulates a smart ambulance system using GNU Radio with Software Defined Radio (SDR) technology, specifically Universal Software Radio Peripheral (USRP), to transmit images. The system employs multicarrier Orthogonal Frequency Division Multiplexing 16-Quadrature Amplitude Modulation (OFDM 16-QAM) with Cyclic Prefix (CP) to minimize ISI and ICI effects. System validation was conducted by observing Signal-to-Noise Ratio (SNR) and Bit Error Rate (BER) in a semi-outdoor channel at 1-3 meters, outdoor at 1-5 meters, and V2V at 10-30 km/h. In the semi-outdoor channel, a distance of 1 meter yielded a BER of 0.4739265 and an SNR of 20.022, while 3 meters yielded a BER of 0.4713733 and an SNR of 28.2842. In the outdoor channel, a distance of 1 meter yielded a BER of 0.4746473 and an SNR of 14.7035, while 5 meters yielded a BER of 0.4739167 and an SNR of 23.4838. In the V2V channel, a speed of 10 km/h yielded a BER of 0.4640428 and an SNR of 18.738 dB, while 30 km/h yielded a BER of 0.4366174 and an SNR of 22.6806. Results show that as distance or speed increases, SNR and BER improve due to error correction and better propagation.

Keywords: Ambulance, BER, SNR, Software Defined Radio, Vehicle-to-Vehicle.