ABSTRACT

Unmanned Aerial Vehicle (UAV) is a plane without crew. UAV can be used for civil or military activities, such as surveillance, mapping, or video capture from the air. To run that function, UAV needs ground station which connected using wireless transmission channel. In this Final Project uses IEEE 802.11n standard as media communication between UAV and ground station.

When flies in the air, UAV will experience change of coordinate position from one point to another. This happens because of multipath due to reflections from ground or from other environment. The multipath causes change of transmission channel follow Rayleigh distribution. The changes of transmission channel causing changes of received power randomly.

Therefore, this Final Project discussed about behavior of IEEE 802.11n transmission channel for media communication between UAV and ground station using stochastic process called Hidden Markov Model (HMM). With that modeling process, gain of 10 dB is obtained against calculations using Two-Ray model at a distance of 20 meters, 30 meters, and 40 meters. HMM prediction results yield the minimum received power at a distance of 400 meters with the highest accuracy measurements of received power reaches 88%, the throughput reaches 80%, and the BER reaches 82% at a distance of 30 meters. With 6Mbps throughput and BER 10^{-4}, IEEE 802.11n suitable as a medium of communication between the UAV-ground station.

Keyword: *UAV, Hidden Markov Model, IEEE 802.11n, Rayleigh fading, transmission rate, SNR, throughput, Bit Error Rate (BER)*