

ABSTRACT

Mobile communication system generally using antenna which have fixed beam pattern. Smart antenna is an adaptive array antenna which could arranges the radiation pattern or the other parameters appropriate with the changing of the desired signal parameters. Smart antenna will directs its maximum radiation pattern to the desired signal and it will directs its minimum radiation pattern to the interference signal. Because of that, with using smart antenna will increase the performance of mobile communication system.

My research will analyze the performance of smart antenna using Recursive Least Square (RLS) algorithm in mobile WiMAX. RLS algorithm will minimize the number of quadrate error estimation in weighting to each element antenna. This simulation will analyze mean square error (MSE) with signal to noise ratio (SNR) using test parameters such as the number of the desired signal user, the number of the interferences, the number of elements antenna, the number of subcarriers, and velocity of the user. Furthermore, this research is to analyze the quality of signal with observe the cost of SNIR in the changing of velocity of the user and the number of interferences.

The result of my research is increasing the performance of smart antenna when using RLS algorithm which describe in the graphic that the MSE is tendency to be decrease on the increasing of SNR in the scale of 0 dB until 30 dB and then the cost of SNIR is big, almost 23dB. The reduction cost of MSE is caused by the decreasing of interferences signal, increase the number of elements antenna, decreasing the number of subcarriers, slow down the velocity of the user. The increasing cost in SNIR depend on lower velocity of the user and small number in interferences. In the multiuser condition when using 4 elements antenna, the simulation give the result that one beam pattern could use for 4 users that close, there are in the 0^0 , 10^0 , 20^0 and 30^0 angle of arrival. The cost of forgetting factor will optimum from this simulation in 0,9.

Keywords : beam, smart antenna, recursive least square, mobile WiMAX, forgetting factor