

ABSTRACT

Growth of wireless application and spectrum allocation limitation are a serious enough problem. In future years, wireless system in Indonesia is expected to be more complex than now. Wireless application development make this problem goes bigger and terrible. Then, radio frequency communication technology that can cover for all types of radio telecommunication system, which can make frequency usage more efficient, optimize power usage, and can self-adapt with radio environment condition automatically, is needed. One of some methods can be used is using cognitive radio application.

In this final assesment, integrated algorithms that can meet the requirement of cognitive radio will be designed and simulated if can be implemented to Transform Domain Communication System. Integrated algorithms that will be designed are Radio Scene Analysis, Channel Identification, Automatic Transmit Power Control, and Dynamic Spectrum Management. System that will be used is Transform Domain Communication System (TDCS), that have ability to find unused frequency and avoiding interference on transmitter as replacement and reduce interference on receiver.

From the simulations results, TDCS can work well on cognitive radio. This can be proved on the simulation that RSA algorithm able to do the channel selection with smallest interference. Then, with ATPC algorithm, the system able to control the transmit power so channel's SINR is kept above the SINR threshold. But, if the transmit power is uncontrollable by ATPC algorithm, so DSM algorithm will update channel database automatically (adaptive) and do self-adaptation with radio environment condition without information interruption to the data that will be sent.

Keyword: TDCS, RSA, ATPC, DSM, Channel Identification.