

UNIVERSITI TEKNOLOGI MARA

**RESOURCE ALLOCATION BASED OFDMA FOR
WIRELESS SYSTEM**

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ABSTRACT

The tremendous growth of wireless network is due to the high demands from various users. As the wireless users increase the availability of radio resources will decrease and become limited. Resource allocation (RA) for wireless networks is the process of deciding how a set of network resources are used. Among various techniques listed in Multiple Access Scheme, Orthogonal Frequency Division Multiple Accesses (OFDMA) has been chosen as a good strategy to allocate the limited resources by sharing channel. In the other side OFDMA has no intracell interferences because each carrier is assigned exclusively to only one user. The integration of OFDMA scheme to RA show good potential to solve limited bandwidth, improve system performance and high robustness. The main problems occur in resource allocation based OFDMA is how to estimate the channel providing optimum power allocation between different sub channels. Scenarios in wireless systems consist of time, frequency and power resources. Power resource allocation is mainly referred as setting the transmit power. The transmitter's power determines the wireless link capacity which further influences the throughput of the whole network. To solve the problems, the objectives of this research is to develop the algorithm to achieve equal power allocation between subcarriers that is almost near to the optimum capacity so that the system capacity based on available error-free instantaneous estimated channel state information at the transmitter can be maximized. The estimations for block type pilot arrangement are based on minimum mean square error (MMSE). The algorithm has been formulated and tested in Matlab environment and the result proves that the problem has been solved and the objectives have been achieved.

Index Terms: Resource Allocation, Power Allocation, Orthogonal Frequency Division Multiple Access, Channel Estimation, MMSE.

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