A
Dissertation
On

# DESIGN AND PERFORMANCE ANALYSIS OF AN EFFICIENT DISTRIBUTED FAULT TOLERANT CHANNEL ALLOCATION ALGORITHM FOR CELLULAR NETWORKS

Submitted in partial fulfillment of the requirement
for the award of the degree of

## MASTER OF ENGINEERING

**(**Electronics & Communication Engineering**)**

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# CERTIFICATE

This is to certify that the work contained in this major project entitled **" Design and Performance Analysis of an Efficient Distributed Fault Tolerant Channel Allocation Algorithm for Cellular Networks"** submitted by **Mrigendra Madhukar** in the requirement for the partial fulfillment for the award of the degree of Master of Engineering in Electronics & Communication, Delhi College of Engineering is an account of his work carried out under my guidance and supervision in the academic year 2007-2008

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The work embodied in this dissertation has not been submitted for the award of any other degree to the best of my knowledge.

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# ABSTRACT

Efficient allocation of communication channels is critical for the performance of wireless mobile computing systems. The centralised channel allocation algorithms proposed in earlier literature are neither robust nor scalable. Here in this dissertation, we present a distributed dynamic fault tolerant channel allocation algorithm. The algorithm does not need a central network switch. The mobile service station of a cell makes all the decision about the channel allocation in the cell. The mobile service station of a cell makes all the decision about the channel allocation in that cell based information available locally. The MSS only needs to exchange information with its neighbours within the co-channel interference range. Unlike the fixed channel allocation algorithm (FCA) the proposed algorithm can adapt to changing load distribution in the network. It is more robust than existing DCA algorithms as it does not depend on a central network switch whose failure could bring down the entire network. The algorithms also exploit the temporal locality of load distribution to make quick decisions about the channel allocation. The symmetry of the channel allocation procedures across the entire network makes the system scalable. The proposed algorithm is prove to be deadlock free, fault tolerant, starvation free and fair. It prevents co-channel interference and can tolerate the failure of mobiles as well as static nodes without significant degradation in service. Here we have compared the our proposed algorithm with Singhal and Cao ‘s algorithm for similar nature of work and fault tolerance and simulation result validate our claim of better performance.

# TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES