GSM-WCDMA Hybrid Localization Techniques in Multilayer Heterogeneous Network

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ABSTRACT

Heterogeneous networks are developed to allow communication devices to access the wireless network using different access technologies. In heterogeneous networks, group of networks can be used to provide particular services. Every service can be delivered to the user using the optimum network for that service. Mobile localization is an important service that can be offered by heterogeneous networks by using the resources of the cellular system to determine the location of a mobile station. LBS include services to identify a location of a person or subject; LBS include parcel tracking and vehicle tracking services. LBS can include mobile commerce when taking the form of coupons or advertising directed at customers based on their location. There is a serious problem faced by rescue workers to identify exact location of emergency callers from mobile network. The accuracy of positioning or localization in such single layer network network depend on the Location Determination Technique (LDT). LDT is to determine the approximate position of a cellular mobile user in a suburban environment is presented. The objectives are to increase the accuracy and precision on mobile location. To implement LDT, two types of methods are used. Which is Enhanced Observed Time Difference (E-OTD) that is for Global System for Mobile Communications (GSM), and ObservedTime Differential of Arrival (OTDOA) is for Wideband Code Division Multiple Access (WCDMA). The proposed method has been implemented and evaluated using simulation on MATLAB software under various mobility models. Simulation shown that the LDT error for hybrid technique can been improved as compared to E-OTD and OTDOA. The simulation will produced the comparison of LDT error on MS/UE with different speed and comparison of LDT error on each types of algorithm.

CONTENTS

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The mobile communication is recently necessary to all population in the world. The late 1990s saw a massive growth in the number of mobile phone users across the developed world. By the year 2000 there were over 500 M users in OECD countries while in Nordic countries the penetration rate had reached 100% of the population. However, much of this growth was expected in the early 1990s as cellular operators concentrated on building their infrastructure. What was totally unexpected was the massive growth in the market for mobile multimedia around the year 2001. Initially, this was satisfied by second generation cellular networks, wireless LANs and digital broadcast systems followed by Third Generation Mobile Systems [1].

Cellular phones or mobile phones are now widely used by a lot of people in all over the world. From year to year the number of mobile phones subscribers increases. For example in the United Kingdom in the end of 1992 there were 1.4 million subscribers [2], then in 1993 the number became 1.8 million [3]. It is a tremendous figure in the growing number of cellular phones subscribers. Based on the data in the International Institute of Communications (IIC), World Bank, Britain sat in the second position of having the largest cellular phones subscribers after the United States in 1989 [4].