

UNIVERSITI TEKNOLOGI MARA

**ANALYSIS OF SIGNAL HEARABILITY
FOR LOCATION DETERMINATION
TECHNIQUES (LDT) IN UITM
GSM AND UMTS NETWORK**

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ABSTRACT

Localization or famously known as Location Base Service (LBS) is an information service, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of the mobile device. The main purpose of LBS is to locate the position of mobile station (MS) whenever it is required. Therefore Location Determination Techniques (LDT) is use to accomplish the mobile positioning purposes. Recently LDT becomes more popular and telecommunications providers take the advantage of this service to gain the profits by commercialized this service to the public. In order to ensure the LDT works accordingly at any locations, parameter so called hearability is a very important parameter to be considered. Hearability is the ability of mobile station (MS) to receive signal from multiple base stations (BS) and satellites. The limitation of hearability is the existence of low hearability whereby the receive signal from base station (BS) is less than three that makes the LDT can't operate accordingly. For this reason, this research was conducted in order to identify hearability condition inside UiTM Shah Alam by analyzing the availability of signal from neighboring BS and satellites then appropriate LDT will be propose according to the hearability condition. To achieve this objective, data measurement campaign at UiTM Shah Alam main road was conducted to collect the related data to hearability such as serving BS, neighboring BS, GPS data and etc by using NEMO Outdoor drive test tools. According to the analysis, hearability in UiTM GSM network is in a very good condition whereby no low hearability area detected and therefore E-OTD LDT can be implemented. For UMTS network analysis, low hearability area existed at several locations however other area was in good condition which OTDOA LDT can be implemented. Since GPS signal is available along the UiTM main road, this method can overcome the low hearability issue incurred in UiTM UMTS network.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In recent years the development of mobile phones is tremendously growing compared to fixed line phones. It has been proofed by the research conducted by Malaysian Communication and Multimedia Commission (MCMC) in Malaysia whereby 30 million of mobile phone user has been recorded in 2010. Therefore it is a very huge number of subscribers in Malaysia that need to serve by the Malaysian telecommunication providers. Besides providing the basic services such as voice, SMS and data, Malaysia telecommunication provider also put their initiative to gives more services to satisfy the subscriber needs in parallel to the development of cellular network for GSM, UMTS and 4G.

Location Based Services (LBS) is one of the Value Added Service (VAS) provides by the telecommunication provider to their subscribers. LBS is an information or entertainment service, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of the mobile device. Generally LBS are targeting enterprise, consumer communities, operators, public safety, national securities and public infrastructure community. LBS for mobile positioning also known as localization whereby Location Determination