Evaluation of Sound Perception to Identify Candidate Frequency for Wireless Networking

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Abstract

Wireless technology has been introduced and growing since early twentieth century, but there are still environments the current technologies find it difficult to penetrate. The dense jungle terrain, for example, pose a huge challenge for the 0.12 m wavelength of the Wi-Fi signals, but the FM radio frequency signals at a wavelength of 3 m function a lot better. This paper studies the possibility of using a very low frequency, down to the range of audible frequencies to try and identify the frequency band that can be used, ubiquitously and unobtrusively. Sound can be considered as a ubiquitous signal due to obvious reasons and the search is to find the unobtrusive frequency band that can be a candidate frequency for data carrier signals. The paper is presented in two sections, the first section does a geographically and age neutral survey to identify the unobtrusive signal and second section analyses the noise profiles in these frequency bands.

Keywords

Ubiquitous computing • Rural networking • Low frequency network signal • Wireless networking

Introduction

As the world is moving closer to bringing network technology closer to the people, the need for ubiquitous mode of operation is now highly pronounced. The Ubiquitous wireless networks need more than the current Wi-Fi signal architectures in order to be more power efficient, better performance in obstructions and for application varied types of environments. One area in which the Wi-Fi in the 2.4 GHz band and other high frequency signals used for communication under the FCC regulations fall short in delivering efficient connectivity is in dense jungle type of environments [10]. Where high frequency signals fail to perform in environments with obstructions, research for low frequency signals to deliver the required connectivity begins. Low frequency signals are not only expected to perform better in the presence of obstacles due to their longer wavelength, they also need much lower power to generate, and hence more sustainable in domains with limited power availability. However, it is also to be noted that as the frequency becomes lower, the maximum bit-rate that can be encoded is also lower and hence usually suitable for low bandwidth connections. It is also advantageous to be able to use some ubiquitous signal, which allows use of existing devices with little or no change for it implementation. Such a system is expected to have minimum cost impact, minimal or no training requirements (for the new system) and a very high acceptance factor. In this light, we are studying the

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K. Elleithy and T. Sobh (eds.), *New Trends in Networking, Computing, E-learning, Systems Sciences, and Engineering*, Lecture Notes in Electrical Engineering 312,
DOI 10.1007/978-3-319-06764-3_43,