Visible Light Position

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ABSTRACT

In this paper, we describe the design and implementation of Visible Light Positioning via camera on a smartphone as a receiver.With the pictures the camera received, we can use the position of the light in the pictures to estimate the smartphone's position.

Keywords

Indoor localization; Mobile phones; Image processing

1. INTRODUCTION

Positioning, also known as localization, is the process of determining the spatial position of an object or person. Accurate positioning is critical for numerous applications.[2] The implement of accurate indoor positioning enables a wide range of location-based services across many sectors. For example, shopping malls and supermarkets are suitable for indoor positioning because it can provide improved navigation which helps avoid unrealized sales when customers cannot find items they want, and it increases revenues from incremental sales from targeted advertising. However, the strong demand forecast, indoor positioning remains a "grand challenge", and no existing system offers accurate location and orientation using unmodified smartphones.
Accurate indoor positioning is not an easy task. Some challenges are still need to conquer. For example, the balance of cost of equipments and the accuracy of the measurement. The positioning error between the actual position and the computed result still has space to improve. How to realtimely compute the position while the smartphone is moving can also be a discussible issue.

2. METHODLOGY

The indoor positioning system consists of visible light beacons, mobile phones, and a cloudlet server.[1] Beacons transmit their identities or coordinates using visible light that human's eye is not perceptible. A smartphone receives these information by using its camera and then send the information to the cloud server to compute the position.

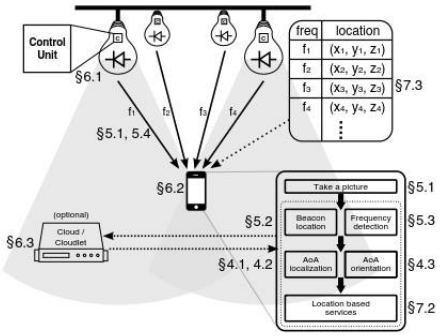

Figure 1:

2.1 Tools

Refer to the testbed in the paper, we consider using five LED beacons, smartphones, and a cloudlet server to compute.

3. REFERENCE

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