[0005] The problem is even greater when taking field force attendance. In this scenario, the task can be demanding and especially challenging when the number of field workers is huge. For companies with considerable work force in a built-up area, stake holders or field managers will need to track the work force movements and progress, for example, to check whether a worker was onsite to do a scheduled maintenance job and how long a worker stayed onsite.

[0006] Thus, what is needed is a robust method / system that is able to detect, record and track locations on different vertical levels of a building economically.

SUMMARY

[0007] According to a first aspect, there is provided a method for vertical location tracking. The method includes scanning a plurality of WiFi signals at a predetermined location on one of a plurality of vertical levels and, for each of the plurality of WiFi signals scanned, recording a service set identifier (SSID) of the WiFi signal, a received signal strength (RSS) of the WiFi signal, and the one of the plurality of vertical levels. The method further includes thereafter determining a vertical level in response to receiving a plurality of WiFi signals, by comparing a SSID and a RSS of each of the plurality of WiFi signals received to the recorded SSID and RSS of the WiFi signals based on a predetermined accuracy range set by a pattern matching algorithm.

[0008] According to a second aspect, there is provided a system for vertical location tracking. The system includes a plurality of mobile devices and a database. The plurality of mobile devices are configured to receive a plurality of WiFi signals from a plurality of WiFi routers with SSIDs, each one of the WiFi routers on one of a plurality of vertical levels and broadcasting a WiFi signal. The database stores the SSIDs and a RSS of the WiFi signals corresponding to each of the plurality of vertical levels. Each of the plurality of mobile devices is further configured to access the database and compare, using a pattern matching algorithm, SSID and RSS of the WiFi signals received from one or more of the plurality of WiFi routers to determine a vertical location on one of the plurality of vertical levels, the pattern matching algorithm using a predetermined accuracy range of RSS of received WiFi signals as compared to RSS stored with SSID of corresponding WiFi signals stored in the database to determine the vertical location on the one of the plurality of vertical levels.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to illustrate various embodiments and to

explain various principles and advantages in accordance with a present embodiment.

[0010] FIG. 1 depicts a flowchart of a method for vertical location tracking using WiFi in accordance with a present embodiment.

[0011] FIG. 2 depicts an illustration of a mapping service in accordance with the present embodiment.

[0012] FIG. 3 depicts an illustration of corridor position tracking in accordance with the present embodiment.

[0013] FIG. 4 depicts an illustration of a query service in accordance with the present embodiment.

CLAIMS

1. A method for vertical location tracking, the method comprising:

scanning a plurality of WiFi signals at a predetermined location on one of a plurality of vertical levels;

for each of the plurality of WiFi signals scanned, recording a service set identifier (SSID) of the WiFi signal, a received signal strength (RSS) of the WiFi signal, and the one of the plurality of vertical levels; and

thereafter determining a vertical level in response to receiving a plurality of WiFi signals, by comparing a SSID and a RSS of each of the plurality of WiFi signals received to the recorded SSID and RSS of the WiFi signals based on a predetermined accuracy range set by a pattern matching algorithm.

2. The method of claim 1, wherein recording the one of the plurality of vertical levels further comprises recording a plurality of predetermined locations on the one of the plurality of vertical levels.

3. The method of claim 1, wherein determining the vertical level further comprises determining a location on the vertical level in response to the SSID and RSS of one or more of the plurality of WiFi signals.

4. The method of claim 1, wherein the pattern matching algorithm picks at least two recorded RSSs.

5. The method of claim 1, the method further comprising initiating a self-mapping process when at least one of the plurality of recorded WiFi signals no longer exists.

6. The method of claim 1, the method further comprises initiating a self-mapping process when a pattern matching result is at or below a lower threshold of the predetermined accuracy range.

7. The method of claims 5 and 6, wherein the self-mapping process comprises:

scanning at least one new WiFi signal at the predetermined location on the one of a plurality of vertical levels; and

for each of the new WiFi signals scanned, recording a SSID of the new WiFi signal, a RSS of the new WiFi signal, and the one of the plurality of vertical levels.

8. A system for vertical location tracking, the system comprising:

a plurality of mobile devices, wherein each of the plurality of mobile devices are configured to receive a plurality of WiFi signals from a plurality of WiFi routers with service set identifiers (SSIDs), each one of the WiFi routers on one of a plurality of vertical levels and broadcasting a WiFi signal; and

a database, wherein the database stores the SSIDs and a received signal strength (RSS) of the WiFi signals corresponding to each of the plurality of vertical levels,

wherein each one of the plurality of mobile devices is further configured to access the database and compare, using a pattern matching algorithm, SSID and RSS of the WiFi signals received from one or more of the plurality of WiFi routers to determine a vertical location on one of the plurality of vertical levels, the pattern matching algorithm using a predetermined accuracy range of RSS of received WiFi signals as compared to RSS stored with SSID of corresponding WiFi signals stored in the database to determine the vertical location on the one of the plurality of vertical levels.

9. The system for vertical location of claim 8 wherein the predetermined accuracy range of RSS of received WiFi signals includes a lower threshold, and wherein each one of the plurality of mobile devices is further configured to initiate a self-mapping process when comparison of the SSID and RSS of at least one of the plurality of recorded WiFi signals is at or below the lower threshold of the predetermined accuracy range, the self-mapping process including detecting previously unrecorded SSID and RSS of at least one WiFi signal corresponding to the determined vertical location.

10. The system for vertical location of claim 9 wherein each one of the plurality of mobile devices is further configured to transmit update information

to the database to add the SSID and RSS of the previously unrecorded SSID and RSS of the at least one WiFi signal corresponding to the determined vertical location.

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