Optimal weighted K-nearest neighbour algorithm for wireless sensor network fingerprint localisation in noisy environment

Abstract

- The weighted K-nearest neighbour (WKNN) algorithm is widely applied to fingerprint positioning. However, the node position estimated by the WKNN algorithm is not optimal in a noisy environment.
- To obtain the optimised node location estimate, the authors propose an optimal WKNN (OWKNN) algorithm for wireless sensor network (WSN) fingerprint localisation in a noisy environment.
- The proposed OWKNN algorithm is composed of an adaptive Kalman filter (AKF) and a memetic algorithm (MA). First, the AKF is utilised to reduce the measurement poise of the received signal strength indication (RSSI) between the nodes in the WSN.
- Then, the MA is employed to optimise the calibration point weight for estimating the position of a target node in the WSN according to the filtered RSSI and a calibrated radio map. Finally, an optimal node location estimate is achieved based on the optimised weight.

EXISTING

- With mutually promotion, smartphones and mobile applications have been both developed rapidly.
- Since users can do anything only by their smartphones in house or far away, almost all people became more and more inseparable from the smartphones and the same smartphones infiltrate into every aspect of life.
- Finding the relations of App usage on mobile Internet is importantfor App developer to mine the users' interests and dig potential users.
- There are a few researches on Web usage by association rules mining, however, to the knowledge of the authors, there are little researches on large- scale App association analysis, due to limitation of App usage

CONTD..

- With the rapid development of mobile Internet, more and more Apps emerge in people's daily life.
- It is important to analyze the relations among
 Apps, which is helpful for network
 management and control

DISADVANTAGE

- It is important to analyze the relations among Apps, which is helpful for network management and control
- Since users can do anything only by their smart phones in house or far away, almost all people became more and more inseparable from the smart phones and the same smart phones infiltrate into every aspect of life.
- Finding the relations of App usage on mobile Internet is important for App developer to mine the users' interests and the potential users.

Proposed system

- we focus on App usage analysis by association rule analysis for the NFP data. Our main task is to obverse which Apps are together used.
- We collect data from ISP traffic data and App detail information by Grawler of the most popular Apps in China.
- And we used Apriori and MS- Apriori mainly do association rules analysis.MS-Apriori is a algorithm based on Apriori to solve the rare item problem that some item appears rarely.
- Through grouping by users of NFP data in specific period, we can get users visitation of Apps in this period.
- Then using Apriori and MS-Apriori, we generate rules and discuss how to select interesting rules. Finally, we analyze the rules we get.
- In this paper, we propose an App usage association rules analysis system. Based on this, App developers can recommend their App to targeted crowd to achieve better results.

CONTD..

- we collect NFP data of users' App visitation records and do association rules analysis using Apriori and MS-Apriori for NFP data to get App usage rules.
- get App usage rules.
 These rules give us some novelty discoveries and inspiration to recommend Apps.

ADVANTAGE

- We do association rules mining on NFP data by using Apriori and MS-Apriori algorithm.
- Experimental results validate our proposed method and present some interesting association rules of Apps.
- We propose an App usage association rules analysis system. Based on this, App developers

can recommend their App to targeted crowd to

achieve better results.

HARDWARE REQUIREMENTS

- Processor
- Speed
- RAM
- Hard Disk
- Floppy Drive
- Mouse

Monitor

- Pentium -III
- 1.1 Ghz
- 256 MB(min)
 - 20 GB
 - Standard Windows Keyboard
 - Two or Three Button Mouse
- **SVGA**

SOFTWARE REQUIREMENTS

- Operating System
- Front End
- Database

- Java / DOTNET : Mysql/HEIDISOL

CONCLUSION

- To improve the accuracy of the existing fingerprint localisation algorithm in a noisy environment, we optimised the calibration point weight for the fingerprint positioning algorithm.
- This optimised weight is calculated by our proposed OWKNN algorithm. The node location mapped by the fingerprint estimate based on the optimised weight is optimal, which has been established in theory.
- In addition, we conducted a large number of practical experiments to verify the effectiveness and efficiency of the proposed algorithm in different target locations, different numbers of beacon nodes, and different calibration cell sizes.
- The experimental results reveal that the OWKNN algorithm improved the positioning accuracy of the state-of-the-art fingerprint localisation algorithm by at least ~50% regardless of the placement of the target node, number of beacon nodes, and size of the calibration cell

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