Optimization Algorithm of Organizing Network Opportunity and Node Position in Intelligent Community of Participatory Sensing System

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Abstract. In order to improve the intelligent decision-making level of participatory sensing system, this paper proposes a new mutual inductance search algorithm. This algorithm uses opportunistic routing principle to select the nodes in the channel, by selecting the closest node as the next hop node, which can greatly improve the decision efficiency. This paper uses opportunistic routing source node to design mutual inductance mathematical model of moral belief culture, and uses PLC to establish the mutual communication of moral belief culture, which realizes the code topology between CPUs of morality and belief user terminal, finally through the path search this paper obtains the basic data of the matching between moral belief culture and the students, which provides a computer method for the study of new participatory mutual inductance system.

Introduction

Participatory sensing emphasizes the participation of people in the process of perception, so people can perception and record of city and social status. The information perceived by a personal or groups through the fusion can be used by other people or groups. This perception mode starts from the perception of individual or groups, and stops when the individual and groups consume the perceptual information, and so forth, it is always the perception participants, controller and influence [1, 2]. This paper applies the participatory sensing system in the training idea of morality and belief, and uses mutual inductance search algorithm to design the communication system of moral belief, and its basic frame is as shown in Figure 1.

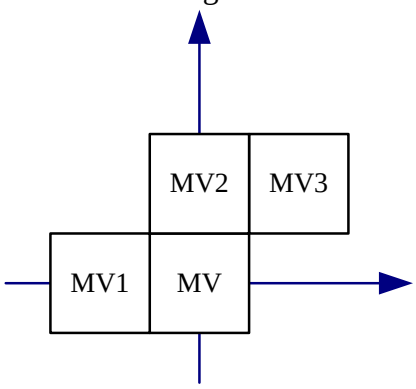

Fig.1: Framework model of moral belief mutual inductance communication

As shown in Figure 1, in the moral belief education coding, block matching algorithm divided the video sequence into $N*M$ block, and adjacent block has the same or similar motion vector, so it can use connecting block to influence the motion vector of the current block [3]. Through the mutual inductance affecting of moral belief, it can realize moral belief cultivation of poor students.

The Mathematical Model and Algorithm Design of Participatory Mutual Inductance System

Subject to the limits of resource, cultivation of moral and belief can't be done for each poor student, but it needs to educate the local scope of the students, it can be as a node to impact the surrounding nearest nodes [4-6]. And it can use opportunity routing to realize algorithm.

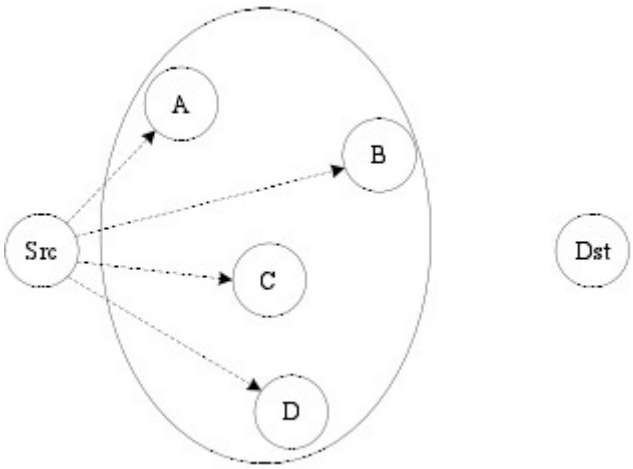

Fig.2: Opportunistic routing principle

Figure 2 shows the opportunistic routing principle. The search principle uses source node to send data to target node, but the wireless nodes is openness, in which A, B, C, and D will receive the data [7]. And the opportunistic routing can choose the nearest node as the next hop node, and its expression is as follows:

$$Y_x = \begin{cases} 1 & \text{The nearest distance for X node} \\ 0 & \text{The X node is not the nearest distance} \end{cases} . \quad (1)$$

So it can establish the mathematical model.

$$Min\mathrm{Y} = \sum_{x=1}^{m}\sum_{s=1}^{m} k_{xs} y_{xs} \quad m = 1,2,\cdots,n . \quad (2)$$

Among them, s is the search times; k is the mutual inductance coefficient. And can be written as the matrix form.

$$y = (y_{xs})_{i\times i} = \begin{bmatrix} y_{11} & y_{12} & \cdots & x_{1i} \\ y_{21} & y_{22} & \cdots & x_{2i} \\ \cdots & & & \\ y_{i1} & y_{i2} & \cdots & x_{ii} \end{bmatrix} . \quad (3)$$

According to the search algorithm model, if the mutual inductance coefficient is n, the basic model of search algorithm is as follows:

$$Minx = \sum_{x=1}^{8}\sum_{s=1}^{8} k_{xs} y_{xs} = 21y_{11} + 18y_{12} + \cdots + 25y_{n3} + 18y_{n4} . \quad (4)$$

In order to realize the mutual inductance optimization model of moral belief education, this paper uses the programming to realize search algorithm, and the main algorithms used is as follows:

```
Algorithm: updateGraph
Input: nodeHistorylnforList,socialGraph
Output: new graph;
For each t in T
For each node i in N
For node j in N-{i}
reduceWeight(i,j);
computeCon (i, j);
coniputeLocs(i,j);
LIO computeComm(i,j);
computeSim(i, j);
w=updateResult(i,j);
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```
If Edge(i,j) is exist and w,j < p
reduceEdge(i,j);
Else If Edge(i, j) is not exist and w" ^p
addEdge(i,j);
.....
```

Participatory Communication Mutual Inductance System Design of Moral Belief Culture

In order to verify the effectiveness and reliability of opportunistic routing and mutual inductance communication model designed in second section, this paper uses PLC to design a participatory mutual inductance communication system of moral belief culture [8, 9]. The basic communication module is as shown in Figure 3.

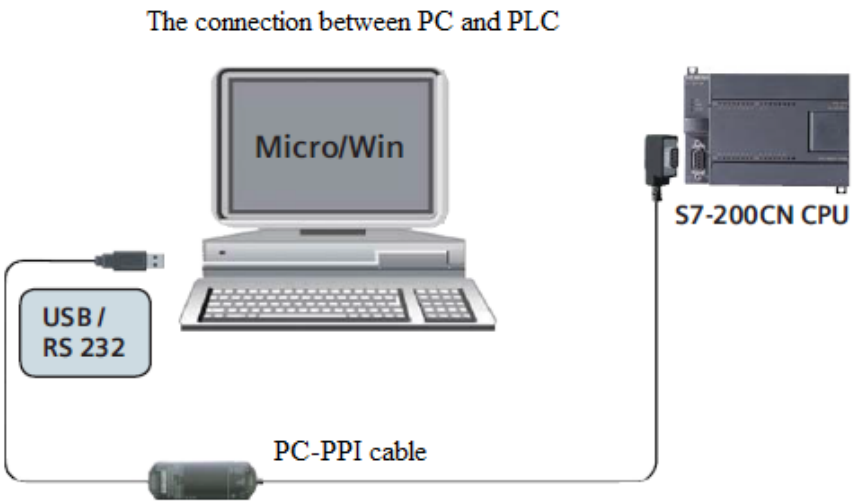

Fig.3: Design of communication module

Figure 3 shows the basic frame structure of communication module. PC machine and PLC directly use USB/RS232 or USB/RS485 to connect, which realizes the mutual inductance communication of moral belief education data [10]. The PLC communication is as shown in Figure 4.

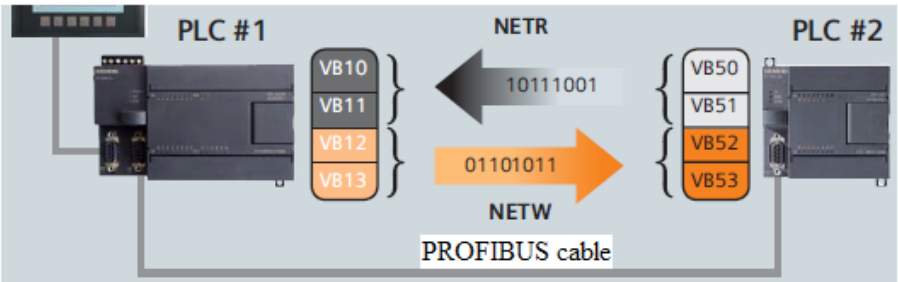

Fig.4: The communication between CPU and CPU

Figure 4 shows using the PLC system to connect the different moral belief user terminal CPU, and communication cable is generally designed as the PROFIBUS cable [11]. In order to save the cost of moral belief education, it can use the MPI protocol as the communication mode.

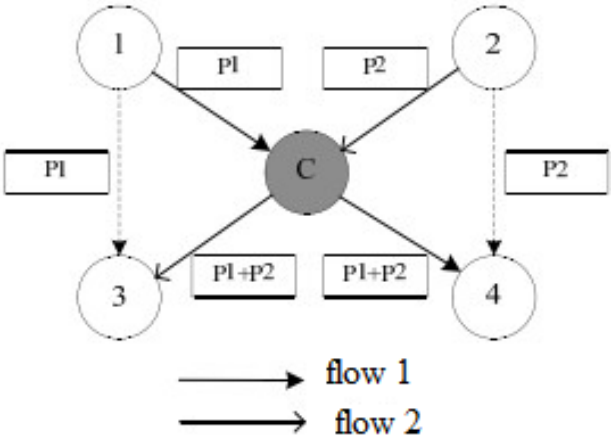

Fig.5: The basic encoding topology structure in the definition of routing

In order to put the whole moral belief education network topology, and improve the application scope and client number, this paper uses ETX to encode the basic node, which is represented by transmitting a packet between the nodes.

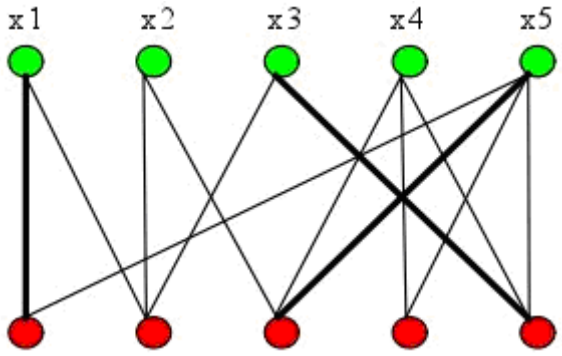

Fig.6: The target search after encoding

Figure 6 shows the schematic diagram of using target path search using the ETX code. Through the search of moral belief source data, data code of target region is obtained. The MPI communication data size is 21 bytes [12]. For the convenience of programming, before communication it needs to send data to the cache and its configuration is as shown in Table 1.

Table 1: Communication data address regular correspondence table

Name	Address after the collection	Regular address
Moral data	MD74	QD8
Belief data	MD78	QD12
The data of poor students	MD82	QD16
The basic moral index	MD86	QD20
The basic belief index	MD90	QD24
Index after the optimization search	I0.0	QB28.0

Table 1 shows the basic code of communication cache address. In order to achieve communication address code, it needs to use PLC to encode the address [13]. This study use the ladder diagram to design the communication module, and the design is as shown in Figure 7.

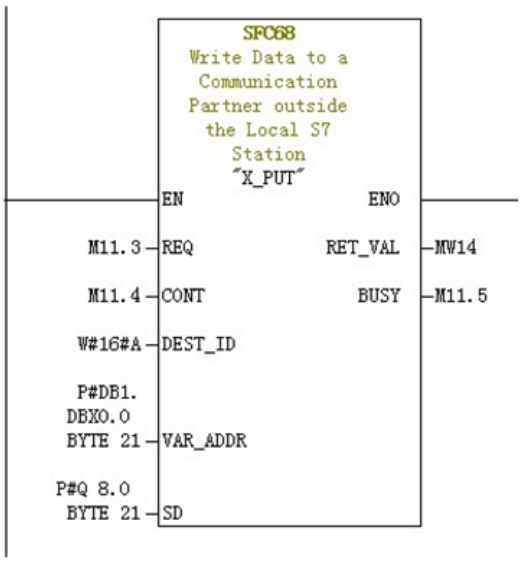

Fig.7: Ladder diagram design of Communication module

As shown in Figure 7, in the moral signal mutual inductance education communication, MPI address of S7-200 is 10, and the corresponding address is VB0VB20 when communication partners receive these variables [14]. Through mutual inductance communication moral belief education method, the result is as shown below:

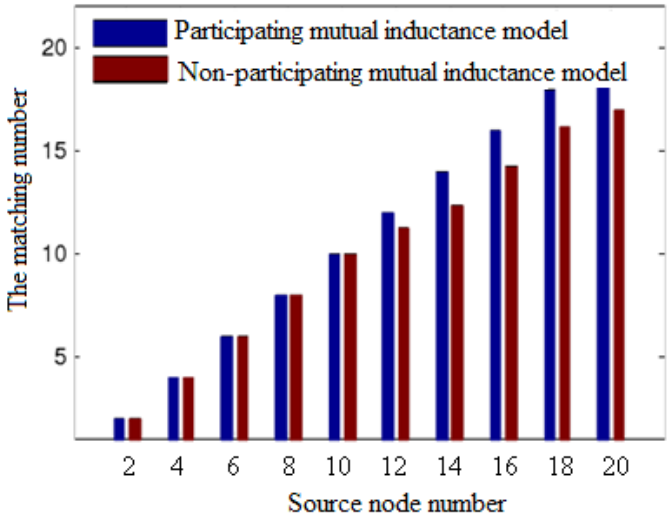

Fig.8: Moral belief culture path calculation

Figure 8 shows the matching result of moral belief culture. Through the life education and poor belief education of the source node, the participatory and non participatory moral belief education results are obtained [15]. The participation moral belief education matches better with the students' basic moral belief, which is a more excellent moral belief education for the poor students.

Summary

On the basis of the principle of participation mutual inductance intelligent decision making system, this paper uses opportunistic routing algorithm to design a new moral culture communication model. This algorithm uses the intelligent opportunistic routing search to select the nearest node of communication distance, which improves the mutual inductance of moral belief culture. This paper uses the PLC system to design mutual inductance communication system of moral belief culture, and the communication module adopts the trapezoidal diagram design, target search using code topology to achieve. Through the calculation of the mutual inductance data, the correspondence relationship between source node and matching number is obtained, which is a new communication mutual inductance of moral belief culture.

Acknowledgments

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