



# Review on 3D Fuzzy Routing Based on Wireless Sensor Network

Anshika Jain<sup>1</sup>, Dr. Suman Sangwan<sup>2</sup>M.Tech Student<sup>1</sup>, Assistant Professor<sup>2</sup>

Department of Computer Science &amp; Engineering

Deenbandhu Chhotu Ram University of Science &amp; Technology, Murthal, Haryana, India

**Abstract:**

Routing protocol specifies how routers share communication with one another by spreading knowledge & information. Routing protocol allows checking routes in various nodes that are present on network. Algorithms decide significant routes in routing; each router has a prior knowledge only of networks attached to it directly. In this research we discuss about increased delivery ratio of packets that should be transmitted from source to destination avoiding unnecessary overhead & Enhancing Network Lifetime. Usually a node dispersed in Wireless Sensor Network is consisting lot of components. It is composition of power generator, processing, sensing, transmitting, and power, mobilize.

**Keyword:** Routing protocol, Wireless communications, Distance-vector, Autonomous, Environmental, Dimensional

## 1. INTRODUCTION

Wireless communication or simply wireless has gained significant importance. Usually Sensor networks consist of different limiting factors that are composition of processing power, limited power energy & storage power.



**Figure.1. Broadcasting communications (Wireless)**

In order to detect external environmental conditions several sensors like humidity, light & accelerator have been generally used in network. The idea of sensor network is to disperse tiny sensing devices as well as processing and transmission. Another idea is to communicate with various devices.

## 2. ROUTING PROTOCOLS

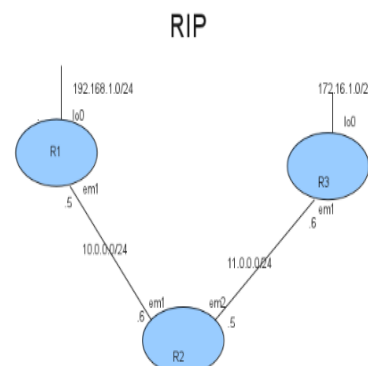
Routing protocols ascertain manner in which communication between routers takes place, spreading knowledge & information in a computer network allowing data to choose routes among different nodes. Algorithms in Routing ascertain optimal path for destination. Router has prior knowledge about adjacent network which could assist in selecting routes between two nodes.

Though various kinds of routing protocol are available, mainly three classes are generally used in case of Internet protocol networks:

- [1] The Link state routing protocol, like OSPF & IS-IS
- [2] Distance vector routing protocol - Routing information protocol, Routing information protocolv2, Interior gateway routing protocol.
- [3] Exterior gateway protocol for sharing information with collection of routers under a common administration system, like BGP, Path Vector Routing Protocol.

## 3. ROUTING INFORMATION PROTOCOL

Distance Vector routing protocol, Routing Information Protocol define hop count i.e. number of immediate devices like routers in terms of a routing metric. Routing information protocol could support a limited size of network because maximum hops allowed are fifteen. If hop count is sixteen then it is contemplated as an endless distance & path is elusive & inapproachable. Split circle, route poisoning & holds downward machine part are implemented by RIP in order to prevent wrong routing information from being proliferated. Routing Information Protocol routers transmits complete updates in each thirty five seconds.



**Figure.2. Routing Information Protocol**

#### 4. ENHANCED INTERIOR GATEWAY ROUTING PROTOCOL

Advanced distance-vector routing protocol, Enhanced interior gateway routing protocol is the latest protocol that is generally used on a computer network in order to automate route decisions & configuration. EIGRP's Partial functionality has been modified to an open standard in year 2013 & was published as informational status in RFC 7868 in year 2016. Enhanced interior gateway routing protocol has been used on a router for sharing routes. Unlike other known routing protocols like Routing information protocol, Enhanced interior gateway routing protocol usually sends act of updates that are increasing. It allows reduced workload on router & amount of data. Here the considerable variables are Bandwidth, load, total delay and Reliability. Bandwidth in kilobits per second along path from router to destination network. Load starts from one to 255. Total Delay is Delay from router to destination network.

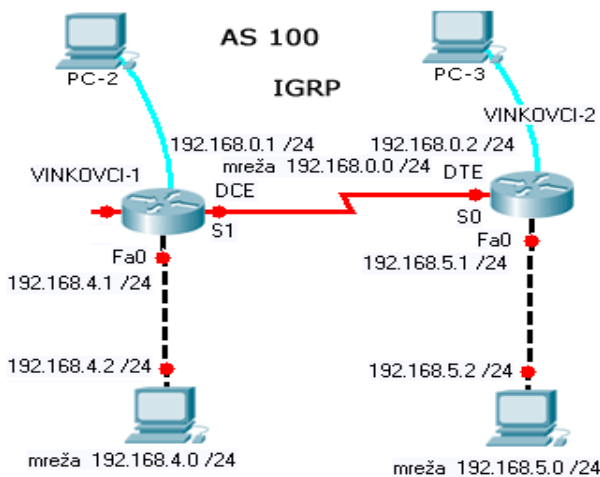


Figure.4. Working of IGRP (Interior gateway routing protocol)

#### 5. MAIN PROBLEMS IN ROUTING PROTOCOLS

1. Non-Uniform Energy Drainage
2. To generate extra control on packet.

Recent routing protocol is known as dynamic three dimensions fuzzy routing that is based on network traffic probability. It is an attempt to solve these problems.

#### MAIN GOALS

- [1] Choose the proper transmission distance path in fuzzy logic in order to move packet from source to destination node.
- [2] To achieve minimum number of hops & decision nodes.
- [3] To make traffic load low and remaining power high.
- [4] To maintain balanced power over network.

#### Fuzzy Logic Brief Description

Fuzzy logic is known as mathematical model of algorithm which seems closer to the way human brain works. It is used in ambiguous mathematical issues/problems. This concept was introduced by Lotfi-Zadeh. Fuzzy Systems are used for Modelling & controlling uncertain and very complicated systems in industry, nature & humanity. The common system for non-

linear mapping of an input data set where scalar output data has been denominated by fuzzy logic system.

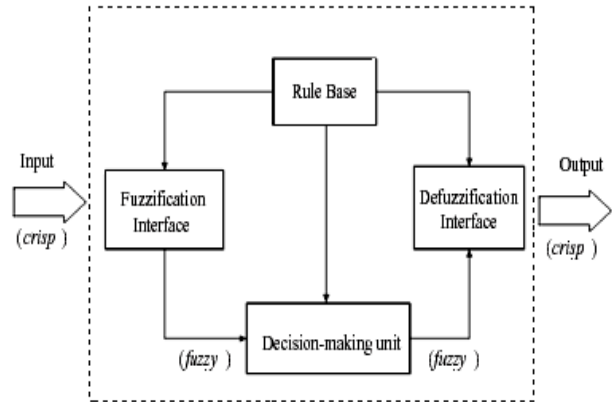


Figure.5. Fuzzy Logic System

#### 6. PROBLEM FORMULATION & MOTIVATION

Network lifetime has significant & special effect on wireless sensor network to limit energy & power of sensors. Moreover packet are to be transmitted/sent to the destination in such a manner that their delivery ratio is increased. Typical nodes dispersed in wireless sensor network are composed of various kinds of constituents including sensor, positioning system & energy generator. The major prerequisites under wireless sensor network are to design an energy efficient & reliable routing protocol. Network lifetime was one of significance factors for evaluation. Network connectivity has to be maintained for long time period that is requiring balanced power consumption of node. As a result, when nodes consume low-power energy, network lifetime & network connectivity are boosted in order to transfer data packets.

#### OBJECTIVES

1. To Increase delivery ratio of packets that are to be transmitted from source to destination.
2. To Avoid additional overhead
3. To Enhance Network Lifetime

#### METHODOLOGY

The proposed routing is to be implemented using Fuzzy Logic System. Fuzzy Logic is a mechanism of reasoning which bears resemblance to human reasoning. It seems closer in the way our brain works.

**Fuzzification** is considered as a method of transforming a crisp value into fuzzy value. Fuzzification unit converts real numbers, also linguistic terms in order to fuzzy set.

**Defuzzification** is the conversion of fuzzy quantity to a precise quantity.

#### 7. CONCLUSION

Routing protocol represents how communication of router is made. Usually node that is scattered in wireless sensor network is having many components including processing, sensing. It is having components such as transmission, energy & powerful

system. Network connectivity would be maintained for much time that needs balanced energy consumption.

## 8. REFERENCES

[1].David Pointcheval, Xavier Boyen, Strong Cryptography from Weak Secrets, D. Bernstein & T. Lange Eds., Springer-Verlag, LNCS 6055, pages 297–315.

[2]. David Pointcheval, Michel Abdalla, Flexible Group Key Exchange within On-Demand Computation of Subgroup Keys, (3-6 might 2010, Stellenbosch, South Africa), D. Bernstein & T. Lange Eds., Springer-Verlag, LNCS 6055, pages 351-368.

[3].David Pointcheval, Password-based Authenticated Key Exchange. (21-23 might 2012, Darmstadt, Gerseveral) Springer -Verlag, LNCS 7293, pages 390-397.

[4]. Cisco Systems (2013), Enhanced Interior Gateway Routing Protocol (EIGRP) Informational RFC Frequently Asked Questions, retrieved 14 September 2013

[5]. Cisco Training White Paper, Global Knowledge Training LLC, 2013, retrieved 17 September 2013

[6]. Cisco Systems (2013), What is Administrative Distance?, retrieved 14 September 2013

[7]. David Pointcheval, Olivier Blazy, latest Smooth Projective Hash Functions & One-Round Authenticated Key Exchange(18\_22 august 2013, Santa Barbara, California, USA), Springer-Verlag, LNCS 8042, pages 449\_475.

[8].David Pointcheval, Olivier Blazy, Efficient UC-Secure Authenticated Key-Exchange for Algebraic Languages(26 February - 1 March 2013, Nara, Japan), 16th International Conference on Practice & Theory within Public-Key Cryptography (PKC '13)Springer-Verlag, Kaoru Kurosawa Ed., Springer-Verlag, 2013.

[9]. IGRP & Enhanced interior routing protocol gateway | Difference Between | IGRP vs EIGRP. Difference Between (2011 -05-19). Retrieved on 2014-05-30.

[10]. Cisco Systems (2012), Enhanced Interior Gateway Routing Protocol (EIGRP) Wide Metrics, retrieved 14 March 2014

[11]. Research Titled “ENHANCEMENT OF SECURITY USING CRYPTOGRAPHIC TECHNIQUES” published by Natasha Saini, Nitin Pandey & Ajeet Pal Singh in 2015

[12]. “A Modified RSA Algorithm in order to Enhance Security for Digital Signature” was research paper published by “Sangita A. Jaju, & Santosh S. Chowhan in 2015