COM2536 – Ders 3
Operations on Discrete Fuzzy Sets
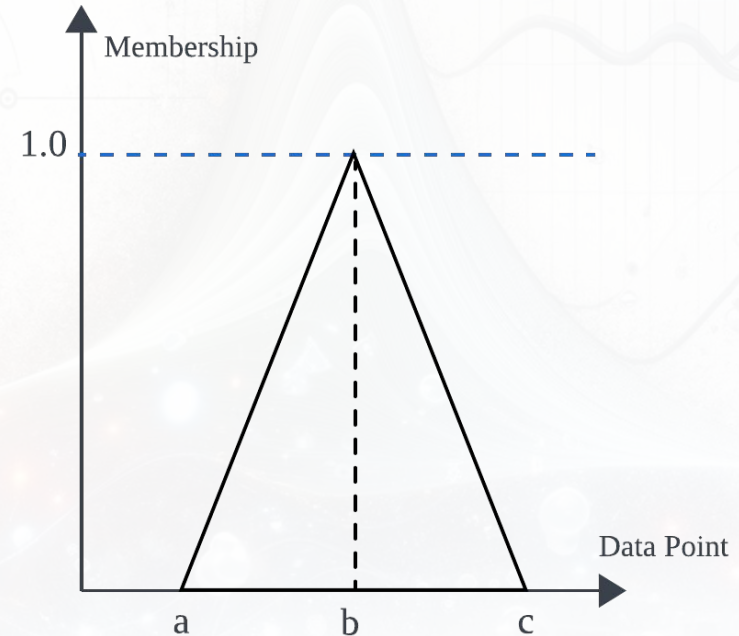
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Uzman

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Some Numerical Examples

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Membership Functions - Triangular

μ = max(min((x-a)/(b-a), (c-x)/(c-b)), 0)

μ = {
    0   if x ≤ a
    (x-a)/(b-a)   if a ≤ x ≤ b
    (c-x)/(c-b)   if b ≤ x ≤ c
    0   if x ≥ c
}

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Membership Functions - Trapezodial

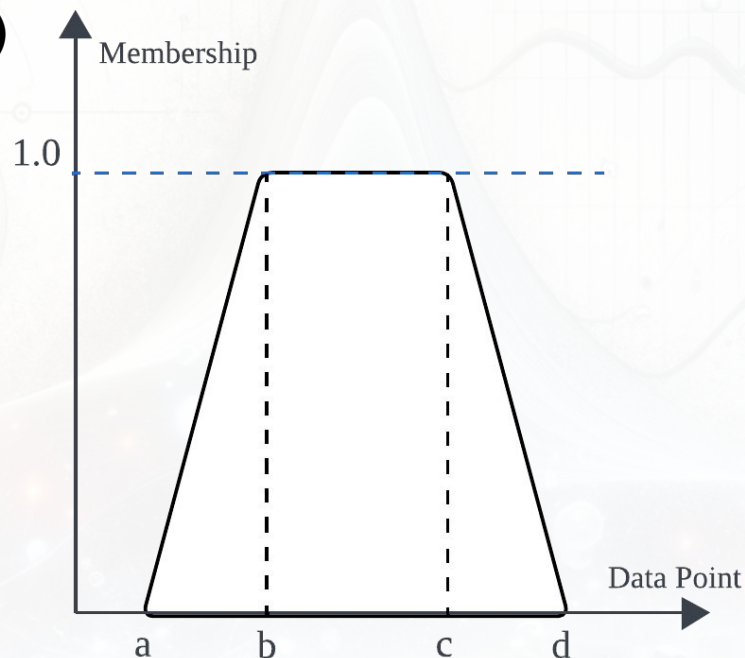$$\mu = \max(\min((x-a)/(b-a), 1, (d-x)/(d-c)), 0)$$

$$\mu = \begin{cases} 0 & \text{if } x \leq a \\ (x-a)/(b-a) & \text{if } a \leq x \leq b \\ 1 & \text{if } b \leq x \leq c \\ (d-x)/(d-c) & \text{if } c \leq x \leq d \\ 0 & \text{if } x \geq d \end{cases}$$

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Alpha Cut

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Some Definitons

Definitions

* Scalar cardinality

* Strong fuzzy set

* Discrete fuzzy set

* Core of a fuzzy set

* Height of fuzzy set

* Normal fuzzy set

* Sub-normal fuzzy set

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Operations on Discrete Sets

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Operations

* Proper sub-set of Fuzzy sets

* Proper super-set of Fuzzy set

* Equality and Inequality of Fuzzy Sets

* Complement Operation

* Intersection Operation

* Union Operation

* Product Operation

* Multiply with Crisp Value

* Power using Crisp Value

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Operations

* Algebraic Sum

* Bounded sum

* Algebraic difference

* Bounded difference

* Cartesian product

* Composition

Some Exercises

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about Term Report

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A Survey on Fuzzy Logic for Cluster Head Selection in Wireless Sensor Networks

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Abstract—Nowadays, WSNs have been widely used in various applications. Many tiny devices used for sensing the environment are called sensors which are important components of a WSN. With the limitation of the power of sensors, many researchers propose numerous algorithms for energy preservation or in the other words to maximize the network lifetime. Clustering algorithm is one of the energy-efficient algorithms by dividing the network into a small group called clusters and then one represent sensor node from each of the group is chosen as cluster head. A cluster head is responsible for collecting and delivering the gathered data to the base station. Cluster head selection is a significant process. For better performance, fuzzy logic has been considered in many works. In this paper, we provide a small survey of recent studies on fuzzy logic for cluster head selection in WSNs.

Index Terms—Wireless sensor network, clustering, fuzzy logic, network lifetime.
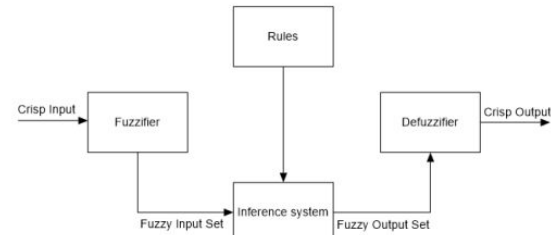
Fig. 1: Fuzzy logic system.

to select appropriate cluster heads for data transmission in the network. Fuzzy logic mimics how a human would make

Paper (Normal)

A Comprehensive Survey of Fuzzy Inference Systems Used for Clustering Problems in WSNs

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Abstract— Intelligent computing has become the new standard for various industries and is considered one of the critical research trends today. With unique advantages under uncertain and varied conditions, clustering and routing in wireless sensor networks (WSN) using fuzzy-based intelligent computing have achieved considerable success. several surveys have been undertaken to analyze the effectiveness and application direction of fuzzy for tackling challenges in WSN. However, a systematic review of the application parameters for the input of the FIS system and its classification protocols on it

The rest of the paper is organized as follows section II provides a brief idea of recent survey papers related to the network performance of wireless sensor networks. Besides, we give our classifications and recommendations on the previous works. Session III presents the classification of fuzzy-based clustering techniques, which helps the following researchers, have a more multi-dimensional view and then find the best algorithm for their problem. Last but not least, we conclude and propose our future work in the last session.

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The Fusion of Deep Learning and Fuzzy Systems: A State-of-the-Art Survey

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Beni Dinlediğiniz İçin Teşekkür Ederim

Sorularınız???

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