



THE INFLUENCE OF MEMBERSHIP FUNCTIONS IN MODELING QUALITY OF SERVICE (QOS) FOR A GSM SERVICE PROVIDER (MTN NIGERIA, KANO REGION) USING ADAPTIVE NEURO-FUZZY BASED INFERENCE SYSTEM (ANFIS)

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ABSTRACT

Adaptive Neuro-Fuzzy based Inference System (ANFIS), an integrated system, is used to model the Quality of Service of GSM network, because it addresses problems related to non-linear and uncertainty of generated data of the GSM Logical Control Channels. The ANFIS Membership Function forms the basis for ANFIS fuzzification, decision, and reasoning. In this paper, different types of membership functions have been used to fuzzify GSM Logical Control channels data from MTN Nigeria, Kano Region. MTN Nigeria is a GSM service provider in Nigeria with over 40 million subscribers; therefore, good Quality of Service (QoS) is highly required. GSM Logical Control channels Data obtained from January 2008 to December 2009 from MTN, Kano Region, were partitioned into training set (75 data pairs represents 75% of the entire data) and checking set (25 data pairs represents 25% of the entire data). Data obtained from January 2010 (31 days) were used as validation data for different types of membership functions. The Generalized bell membership function 'gbellmf' generates the least Average Forecasting Error. It can be deduced that, using an improper membership function, high error will be generated by the membership function and subsequently the generated error will enter the actual data, and as a result of this, the model prediction will not be accurate.

Keywords: Adaptive neuro-fuzzy based inference system, GSM logical control channels, membership functions, quality of service.

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