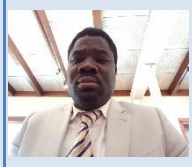
TOPIC	An Overview of Interval Type-2 Fuzzy Systems and Its Applications
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	Machine Learning and Fuzzy Logic Control
SPEAKER	Gabriel Awogbami
DATE	Friday October 7, 2016
TIME	3:00 – 4:00 P.M. (EST)
VENUE	Fort IRC 410, North Carolina A&T State University, UTSA and SIPI will be joining through video-conferencing
FEES	No Charge

SYNOPSIS

Most real-world applications of intelligent systems are associated with the problem of uncertainties. In order to mitigate this problem, we need to seek a reliable method for modelling and handling of these uncertainties. Several techniques have been used to quantify uncertainties such as fuzzy logic, statistical theory, and Bayesian probability theory. Statistical and Bayesian probability theories make prediction about the occurrence of an event based on partial knowledge. The conventional type-1 fuzzy sets have been deployed in the general framework of approximate reasoning. The inability of type-1 fuzzy sets to capture uncertainty gave birth to the development of type-2 fuzzy sets. The type-2 fuzzy sets enable incorporation of uncertainty about the membership function and knowledge from experts into fuzzy set theory. The structure of type-2 fuzzy logic system is similar to that of type-1 fuzzy logic system except that the defuzzification stage is being replaced by output processing stage which is a combination of type-reducer and defuzzifier. It is evident that the difference between the architecture of type-1 and type-2 fuzzy logic system is the introduction of an additional stage called type- reduction. The key role of the type-reducer is to convert type-2 fuzzy sets into an interval type-1 fuzzy set, which in turn will be converted into a crisp output by defuzzifier. Popularly used methods are centroid and centre of sets. In this talk, I will focus on an overview of interval type-2 fuzzy sets and systems, centroid type-reduction algorithms with emphasis on Karnik-Mendel (KM) algorithm, and other enhancement techniques to reduce its computational complexity and a numerical example to demonstrate its practical applications in testing and evaluation of autonomous vehicles.

ABOUT THE SPEAKER



Gabriel Awogbami is a PhD student at North Carolina A&T State University. He is currently a graduate research assistant at Autonomous Control and Information Technology(ACIT) Institute, working on Machine Learning and Fuzzy Logic Control. He received his BS and MS degrees in Electrical Engineering from Federal University of Technology, Akure, Nigeria, and University of Alabama in Huntsville, USA respectively.