Prof Ahmed Rubaai, Fellow IEEE

BIOGRAPHYAHMED RUBAAI received the M.S.E.E degree from Case Western Reserve University, Cleveland, OH, and the Dr. Eng. degree from Cleveland State University, Cleveland, OH, in 1983 and 1988, respectively. In 1988, he joined Howard University, Washington, DC, as a faculty member, where he is presently a Professor and Chairperson of the Electrical Engineering and Computer Science Department. Dr. Rubaai has been named an IEEE Fellow in 2015**.**

His work covers a broad range of manufacturing and product applications and exemplifies his ability to bridge between academic research and the application to industrial applications. The bridges that Dr. Rubaai has built between industry and academia represent a uniquely valuable contribution that can be matched by very few others in the academic world today. In recognition of his scholarly work and dedication to the improvement of engineering education, his work is recognized by the larger community of engineering educators, as verified by his receipt of the 2011 ASEE Robert G. Quinn Award and the Distinguished Educator Award of the Middle-Atlantic Section of the American Society for Engineering Education. This recognition is a clear demonstration and confirmation of his peers' high regard for his contributions to engineering education.

Hierarchical Multi-layer Fuzzy Logic Controller for the Stability Improvement of Interconnected Power Networks

ABSTRCT

In this talk, a multi-layer fuzzy logic controller (MLFC) is proposed for the stability enhancement of interconnected power networks making use of a dynamic braking strategy. The proposed controller has two layers: The first layer termed the supervisory layer specifies the region of operation of the sub-controllers within the second layer called the execution layer. The outputs of the sub-controllers are then fuzzily combined to achieve the overall objective of the system. Following a disturbance, the generator speed deviation and its derivative are computed from real time measurements as inputs to the fuzzy logic controller and the output of the fuzzy sub-

controllers represents the conductance value of the dynamic braking resistor. The proposed controller was found to be very robust to any changes in the network configuration. The MLFC was found to be very “robust” – insensitive to changes in the network configuration. The scheme was tested on IEEE nine-bus system with three generators and three loads and on the IEEE four generator test system. A comparison with a two-level hierarchical controller was made to show the effectiveness of the proposed method. The simulation results obtained support the concept of the multi-layer fuzzy logic-based braking resistor control scheme and as a valuable tool for short term and long-term stability crisis management.