RESEARCH FOCUS OF DR ONASANYA BABATUNDE OLUWASEUN

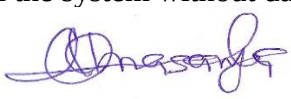
My research interest is mainly in the area of fuzzy mathematics with particular applications in algebraic groups, multisets and multigroups, hyperstructures and impulsive control of non-linear systems. These studies also have some extensions to decision-making, optimisation and artificial intelligence.

I have worked on fuzzy and anti fuzzy subgroups of a group. Some generalisations of some existing results in group theory relating to cosets (left, right, middle), homomorphisms, normaliser, group action, orbit-stabiliser theorem e.t.c were made. Also, level sets of a fuzzy subset have been used to develop a fuzzy topological space that can further be studied in details. Of a particular interest is the result which establishes that results in fuzzy subgroup suffice for anti fuzzy subgroup since its membership function is related to the complement of the fuzzy subgroup. As a matter of fact, I have harmonized some fuzzy subgroups (fuzzy subgroups arising from Zadeh fuzzy sets, intuitionistic fuzzy sets and Pythagorean fuzzy sets) into one structure. Recently, I began to study fuzzy Combined Effect Time Dependent (CETD) matrices in analysing situations.

Multisets have very similar operations as fuzzy sets. Some of my studies have considered the algebraic properties of these sets, extend them by introducing fuzziness and have developed functions which can serve as algorithm for use in structural query language (SQL) for decision-making in medicine and general management. Some properties of certain algebraic concepts such as multicosets were also studied. Particularly, some of my studies have established that certain medical information can turn out to be multisets and can also be fuzzified to be used as a tool for medical diagnosis. Some of my studies in this area have established how mutlisets can be used to manage purchase order, records in the sores, information sorting and the like.

My studies have partly focused on algebraic hyperstrutures and some associated fuzzy structures. I have established some chemical and biological phenomena as algebraic hyperstructures, meaning they can be modelled by hyperstructure theories. Some more complex works in my research have focused on the link between fuzzy sets and some structures as hyperstructures and multisets.

In the recent time, I have begun to study fuzzy impulsive control of some non-linear systems of differential equations. Usually, the goal is to find a control matrix $\boldsymbol{J}$ which, when introduced into a chaotic system at some interval of times (not necessarily equal), the energy of the system gradually becomes or nearly becomes zero. Most researchers have considered a constant matrix $\boldsymbol{J}$ which is not so in real life. I have developed, rather, a fuzzy matrix $\boldsymbol{J_\alpha}$ which is more flexible and can easily adapt to the errors and changes in the system without damaging the system.



DR. B.O. ONASANYA

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Date