

RESEARCH FOCUS

My research interests are in the broad area of Pure Mathematics and with focus and contributions in two major areas. The first is the study of group of multiplicative units of Burnside ring of various finite groups. This aspect of my research falls in the area of Algebra (K_0 -Theory) and the other is the classification and enumeration of Fuzzy p -subgroups and classical p -subgroups, respectively, in the area of Groups of Prime Power Order.

The units of Burnside ring $B^*(G)$ of a finite group G , just like its Burnside ring $B(G)$ occurs as important invariants such as ordinary homology and cohomology theories, extraordinary homology and cohomology theories, and homotopy theory in algebraic topology. The structure of $B^*(G)$ was identified to be an elementary abelian 2 - group . In particular, finding the rank of $B^*(G)$ should be an easy problem. It is a very hard problem, for example if a group G has odd order, then $B^*(G) = \{+1, -1\}$, but for an arbitrary finite group of even order, not so much is known on this problem. The research problem was completely solved for elementary abelian 2 - groups and cyclic groups G . In addition, a connection between $B^*(G)$ and the associated exterior algebra was derived. The goal is to obtain $B^*(G)$ for arbitrary finite group and generalize the computations of $B^*(G)$ to finite nilpotent and solvable groups.

Another part of my focus is on counting subgroups and classifying Fuzzy subgroups. These techniques have been areas of interest for their wide applications in informatics and Coding theory. In classical and Fuzzy group theories, some results on counting subgroups and classifying Fuzzy subgroups of finite abelian groups and finite nonabelian groups have been established. However, not so much is known on this problem for groups of prime power order. The significant of this focus could enhance the safety of a finite nonabelian based public key.