
Review of Literature

Topology is one of the widely studied areas of mathematics emerged through the works of the great mathematician Henri Poincare in the 19th century. Topological structures on the collection of data are suitable mathematical models for mathematizing not only quantitative data but also qualitative data.

Topological spaces

Initially, openness is the basic concept for the study and investigation of topological spaces. Later Stone (1937) introduced regular openness which is stronger than openness and Levine(1963) introduced the notion of semi openness which is weaker than the notion of openness. Since then several interesting generalized open sets had come into existence. Njastad (1965) introduced α -open sets in topological spaces. The study of generalized closed sets was introduced by Levine (1970) in order to extend the topological properties of closed sets to a large family of sets. Mashhour et al. (1983) introduced α -closed sets. Using the concept of α -closed sets, Maki et al.(1993, 1994) introduced the concepts of generalized α -closed sets and α -generalized closed sets and investigated the properties between these two sets. Dontchev (1995) defined gsp-closed sets and studied their properties. Gnanambal (1997) introduced and studied the concept of gpr-closed sets.

Veera Kumar (2000a) investigated a new class of closed sets called ψ -closed sets which contains the class of semi closed sets and contained in the class of semi pre closed sets. Veera Kumar introduced g^* -closed sets (2000b), g^*p -closed sets(2002a), $g^\#s$ -closed sets(2002b), \hat{g} -closed sets(2003a) and $g^\#$ -closed sets (2003b). Rajamani and Vishwanathan (2004) defined α gs-closed sets. Veera Kumar introduced the concept of $g^*\psi$ -closed sets (2005a), $^\#gs$ -closed sets(2005b) and *g -closed sets(2006). Abd El.Monsef et al. (2007) defined $\alpha\hat{g}$ -closed sets. Jafari et al.(2010) introduced \tilde{g}_α -closed sets and proved that \tilde{g}_α -closed sets form a topology. Ramya and Parvathi (2013) introduced ψg -closed sets and $\psi\hat{g}$ -closed sets in topological spaces.

Separation axioms is one of most important concepts in topological spaces. One of the well known weaker separation axiom is T_1 in which singleton sets are closed. Many new separation axioms were defined while investigating generalized closedness.

Devi et al. (1993, 1998) introduced T_b -space, T_d -space and ${}_aT_b$ -space, ${}_aT_d$ -space. Maki et al. (1993) introduced ${}_{1/2}T_\alpha$ -space, ${}_aT_{1/2}$ -spaces and examined the relations between these spaces.

Continuous maps are important notions in the field of mathematics. Several researchers working in the field of general topology have shown interest in studying the properties of generalizations of continuous maps. Levine (1960), Arya and Gupta (1974) and Jain (1980) introduced respectively strongly continuous maps, completely continuous maps and totally continuous maps. Mashhour et al. (1983) defined and studied α -continuous maps. Noiri (1984) and Dontchev (1996) introduced respectively perfectly continuous maps and contra continuous maps. Devi et al.(1997) introduced and studied αg -continuous maps and $g\alpha$ -continuous maps. Jafari and Noiri (2001) introduced contra α -continuous maps. Veera Kumar introduced ψ -continuous (2000a), g^* -continuous (2000b), \hat{g} -continuous(2003a) and *g -continuous(2006) maps. Crossley and Hildebrand (1972) investigated irresolute maps and proved that irresolute maps are stronger than semi continuous maps but are independent of continuous maps.

Many authors introduced and studied several weaker forms of closed and open maps. Malghan (1982) introduced and analyzed the concept of generalized closed maps. Mashhour et al.(1983) studied α -closed maps. Devi et al. (1998) introduced αg -closed maps and $g\alpha$ -closed maps. Maki et al. (1991a) introduced and studied g -homeomorphisms and gc -homeomorphisms in topological spaces. Garg et al. (2010) introduced and studied ψ -homeomorphisms.

Lellis Thivagar (1991a) introduced the weak and strong forms of open maps called quasi α -open maps and strongly α -open maps using α -open sets. Navalagi (1998) introduced quasi α -closed maps and strongly α -closed maps using α -closed sets. Lellis Thivagar (1991b) defined and studied quotient maps, α -quotient maps, semi-quotient maps and pre-quotient maps in topological spaces. Anitha and Mariasingam (2013) introduced \tilde{g}_α wg -quotient maps and studied the relations between strong and weak forms of \tilde{g}_α wg -quotient maps.

Bitopological spaces

Kelly (1963) initiated the study of bitopological spaces by defining as a triple (X, τ_1, τ_2) where X is a non-empty set, τ_1 and τ_2 are topologies defined on X . This structure

is a richer structure than that of a topological structure. Thereafter many topologists have generalized topological concepts to bitopological spaces and obtained interesting results. Maheshwari and Prasad (1977-78) introduced semi open sets in bitopological spaces and further the properties of this notion were studied by Shantha Bose (1981). Fukutake (1985) conceived the concept of g -closed sets in bitopological spaces. Fukutake et al. (2002) introduced the notion of gpr -closed sets, gpr -continuous maps in bitopological spaces. Fukutake et al. (2002) introduced and studied ω -closed sets, ω -open sets, and ω -continuous maps in bitopological spaces. Sheik John and Sundaram (2004) introduced g^* -closed sets, g^* -continuous maps, (i, j) - $T_{1/2}^*$ and (i, j) - $T_{1/2}^*$ -spaces in bitopological spaces and examined their properties.

El-Tantawy and Abu-Donia (2005) introduced ij - $g\alpha$ -closed sets, ij - αg -closed sets, ij - sg -closed sets, ij - gs -closed sets, ij - gp -closed sets along with their respective continuous maps and derived some generalizations of separation axioms in bitopological spaces using the concept of g -closed sets. Veronica and Reena (2012) introduced $g^\#$ -closed sets. Lellis Thivagar and Nirmala Rebecca Paul (2013) introduced \tilde{g}_c -closed sets, \tilde{g}_c -continuous maps, $(i, j) T_{\tilde{g}_c}$ -space and $(i, j) {}^\#T_{\tilde{g}_c}$ -space and derived a new decomposition of continuity in bitopological spaces. Imran (2014) introduced the concept of $g\alpha^{**}$ -closed sets in bitopological spaces. Abu Donia et al. (2015) introduced the concepts of ij - ψ^* -closed sets, ij - ψ^* -continuous maps, $ijT_{1/5}^{\psi^*}$ -space and $ij^{\psi^*}T_{1/5}$ -space and studied their properties.