

Chapter 10

Formulae for Finding the Number of NeuroTopological Spaces

Bhimraj Basumatary
Bodoland University, India

Jili Basumatary
Bodoland University, India

Nijwm Wary
Bodoland University, India

ABSTRACT

There is a relation between classical topological space and NeuroTopological space. Every classical topological space generates a NeuroTopological space, and every anti-topological space generates a NeuroTopological space. According to NeuroTopological spaces, NeuroTopological spaces have a broader structure. Thus, the neutrosophic theory's (T, I, F) components are added to traditional topological space, yielding a new structure. Topology is a branch of mathematics that works with particular definitions for spatial structure notions, compares them, and analyses the relationships between the structure and the set's qualities. In topology, the initial step is to define a general definition of the fit, followed by an investigation of the connections between topological structures derived from various methodologies. Finding the number of topologies in a set is challenging work. In this chapter, the formulas for finding the number of NeuroTopological spaces having two and three open sets are defined. Further, formulae for non-NeuroTopological space are defined.

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INTRODUCTION

Smarandache (1998) defined the idea of neutrosophic logic and the concept of a neutrosophic set. After defining the neutrosophic set many authors applied the idea of the neutrosophic set in many branches of science and technology. Many authors extended the idea of the neutrosophic set to various fields of pure and applied mathematics. Topology has a wide range of applications, from analysis to geometry. Because of these features, many researchers have worked on topology. Salama and Alblawi (2012) proposed the concept of neutrosophic topological space. Sumathi and Arockiarani (2016) introduced the idea of the topological group structure of the neutrosophic set after defining the neutrosophic group, while Sumathi and Arockiarani (2015) researched the fuzzy neutrosophic group. Separation axioms in ordered neutrosophic bitopological space were studied by Devi *et al.* (2017). Mwchahary and Basumatary (2020) studied neutrosophic bitopological space.

The centroid single valued triangular neutrosophic numbers and their applications were studied by Şahin *et al.* (2017), a generalized neutrosophic soft expert set for multiple-criteria decision-making was obtained by Uluşay *et al.* (2018), soft neutrosophic modules were recently introduced by Bal *et al.* (2018), and neutrosophic soft expert multiset and their applications were recently studied by Bakbak *et al.* (2019a, 2019b).

An emerging subject of study called NeutroAlgebras & AntiAlgebras is motivated by the reality around us. All of the axioms and all of the operations are fully defined in classical algebraic structures, but in real life, in many cases, these restrictions are too harsh since in our world we have things that only partially verify some laws or some operations. The concept of neutro-structures and anti-structures was first defined by Smarandache (2019, 2020a). Smarandache (2020c) studied the NeutroAlgebra as a generalization of partial algebra. Şahin *et al.* (2021) discussed the idea of NeutroTopological space and anti-topological space.

The concepts of neutro-groups, neutro-sub-groups, neutro-rings, neutro-subrings, neutro-ideal, neutro-quotient-rings, and anti-groups were explicitly introduced by Agboola (2020a, 2020b, 2020c, 2020d) who also proved some properties of these structures and their sub-structures. Neutro-BE-algebras and anti-BE-algebras are concepts that were presented by Rezaei and Smarandache (2020a). Anti-rings were introduced and some of their features were established by Agboola and Ibrahim (2020). The concept of neutro-vector spaces was first presented by Ibrahim and Agboola (2020b). Rezaei and Smarandache (2020b) worked on the neutrosophic triplet of BAlgebras. Smarandache and Hamidi (2020) introduced neutro-bck-algebra. Ibrahim and Agboola (2020a) studied neutro-hypergroups. Smarandache *et al.* (2020), proposed a new concept of neutro-CI-algebras and anti-CI-algebras. Jiménez *et al.* (2021) studied neutroalgebra for the evaluation of barriers to migrants' access.

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