

A NEW GRAPH TOPOLOGY ON DECOMPOSITION OF GRAPH

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Abstract: In this paper, we explore the extension of topological concepts to graph theory by defining a graph topology as a collection of sub-graphs within a graph G that satisfy properties analogous to the axioms of point-set topology. Specifically, we focus on the edge-induced sub-graph topology, where open sets are sub-graphs formed by subsets of the edge set E of G . Building upon this framework, we introduce the concept of an N -graph topological space, generated by these edge-induced sub-graphs. This novel approach facilitates a deeper exploration of the interplay between graph-theoretical structures and topological spaces, potentially leading to new insights and applications in both fields.

Keywords and Phrases: Graph Topology, Edge-Induced sub graph Topology, N -Graph Topological Space, N -Graph Topology, N -open sub graph, N -closed sub graph, N -graph Interior, N -graph closure.

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1. Introduction

The primary objective of this study is to visually demonstrate key concepts from topology. By observing graphical representations of topological spaces and properties on a two-dimensional surface, several topological results become more intuitive and engaging. Initial discussions of these concepts can be traced back to work in [[1], [2], [3], [4], [6], [9], [12], [11]]. In addition, the notion of a topology in a graph, defined through its subgraphs, was introduced and analyzed in [10].