

## **Computation of Graph Vulnerability Measures and Topological Indices**

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Vulnerability measures and topological indices are crucial in solving various problems such as assessment of communication networks and development of mathematical models for chemical compounds. In this paper, I will establish formulas for certain graph vulnerability measures such as Residual Closeness and certain topological indices such as hyper-Wiener index for various graphs. I will do this by computing Hosoya polynomials (also called Wiener polynomials) and their derivatives. It is amazing to see how Hosoya polynomials give powerful tools for fields of Communications and Chemistry.

Key words: Graph Vulnerability measures, Topological indices, Hosoya polynomials