

Looking For Saturation In All Kinds of Places

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Given a graph H , a graph G is H -saturated if G does not contain H as a subgraph, but the addition of any missing edge to G results in a graph containing H as a subgraph. An H -saturated graph with the maximum number of edges is called an extremal graph for H and for a given order n we denoted this maximum size as $\text{ext}(n, H)$. This is the well-known extremal number (or Turan number) of H and is a very well studied notion with a deep and beautiful theory. However, the focus of this talk will be on many other saturation questions that can be asked. These include what is the minimum number of edges in an H -saturated graph? For a given order n , what edge sizes, other than the minimum or maximum, also allow H -saturated graphs? Is it possible to order the inclusion of missing edges so that at each stage more copies of H will be included? What about saturation in other settings such as in edge colored graphs, or in random graphs, or within graphs other than the complete graph?

Keywords: saturation, saturation number, saturation spectrum, weak saturation