Guessing Numbers and Extremal Graph Theory

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For a given number of colors, s, the guessing number of a graph is the (base s) logarithm of the cardinality of the largest family of colorings of the vertex set of the graph such that the color of each vertex can be determined from the colors of the vertices in its neighborhood. This quantity is related to problems in network coding, circuit complexity and graph entropy. In this talk we will present work on the guessing number of graphs as a graph property in the context of classic extremal questions, and its relationship to the forbidden subgraph property. This includes the determination of the extremal number with respect to the property of having guessing number $\leq a$, for fixed a, an upper bound on the saturation number for this property, and showing that, for a fixed number of colors, bounding the guessing number is equivalent to forbidding a finite set of subgraphs.