KIARA MCDONALD, University of Victoria
Broadcast Independence in Different Classes of Graphs

In the area of Graph Theory, the well-known problems of domination, packing and independence are generalized by broadcast domination, broadcast packing and broadcast independence. As an analogy and application, consider a city, where one wants to place cell towers of different signal strengths subject to certain conditions. If every building in the city hears the signal from at least (respectively at most) one tower, then the broadcast is dominating (respectively packing). If no tower hears the signal from another tower, the broadcast is independent. The sum of the tower signal strengths is called the cost of the broadcast. The total cost of a maximum independent broadcast is called the broadcast independence number.

Our research was focused on determining explicit formulas and polynomial time algorithms for the broadcast independence number of various types of graphs. This parameter is difficult to compute for graphs in general, so we restrict the problem to specific classes of graphs to make use of their special structural properties to solve the problem. For a graph from a given class, we constructed a new graph, called the broadcast ball intersection graph. We were able to show that if the broadcast ball intersection graph is weakly chordal, then broadcast independence is polynomial time solvable for the given class of graphs. This talk is based on joint work with Richard Brewster (TRU) and Jing Huang (UVic).