TAITE LAGRANGE, University of Waterloo
When the twin-width is sub-linear

Twin-width is a graph and matrix parameter that was introduced in 2021 by Bonnet, Kim, Thomassé, and Watrigant as essentially a measure of the accumulated 'error' between vertex neighbourhoods over a series of vertex contractions. This talk focuses on when the twin-width of a graph class can be bounded by some sub-linear function on the number of vertices. We present a technique for obtaining twin-width bounds in general by contracting a graph based on a partition by distinct neighbourhoods and use this to give a sub-linear upper bound on the twin-width of graphs of bounded VC-dimension, a parameter which can be formulated for graphs to measure the structural complexity of vertex neighbourhoods. Our result implies that a hereditary class of graphs $\mathcal{C}$ has sub-linear twin-width if and only if $\mathcal{C}$ has bounded VC-dimension.

This is joint work with Therese Biedl and Sophie Spirkl.