

Boundary properties of graphs

Vadim V. Lozin
University of Warwick
UK

Abstract

The notion of a boundary graph property is a relaxation of that of a minimal property. Several fundamental results in graph theory have been obtained in terms of identifying minimal properties. For instance, Robertson and Seymour showed that there is a unique minimal minor-closed property with unbounded tree-width (the planar graphs), while Balogh, Bollobás and Weinreich identified nine minimal hereditary properties with the factorial speed of growth. However, there are situations where the notion of minimal property is not applicable. A typical example of this type is given by graphs of large girth. It is known that for each particular value of k , the graphs of girth at least k are of unbounded tree-, clique- or rank-width and their speed of growth is superfactorial, while the 'limit' property of this sequence (i.e., acyclic graphs) has bounded tree-, clique- and rank-width and their speed of growth is factorial. To overcome this difficulty, we introduce the notion of boundary properties of graphs and identify some of them with respect to various graph problems.