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*On the size of  $(H_1, \dots, H_r)$ -co-critical graphs.*

Given an integer  $r \geq 1$  and graphs  $G, H_1, \dots, H_r$ , we write  $G \rightarrow (H_1, \dots, H_r)$  if every  $r$ -coloring of the edges of  $G$  contains a monochromatic copy of  $H_i$  in color  $i$  for some  $i \in \{1, \dots, r\}$ . A non-complete graph  $G$  is  $(H_1, \dots, H_r)$ -co-critical if  $G \not\rightarrow (H_1, \dots, H_r)$ , but  $G + e \rightarrow (H_1, \dots, H_r)$  for every edge  $e$  in  $\overline{G}$ . Motivated by Hanson and Toft's conjecture, we study the minimum number of edges over all  $(K_t, \mathcal{T}_k)$ -co-critical graphs on  $n$  vertices, where  $\mathcal{T}_k$  denotes the family of all trees on  $k$  vertices. In this talk we will survey the history of  $(H_1, \dots, H_r)$ -co-critical graphs and discuss the main ideas of our recent results on  $(K_t, \mathcal{T}_k)$ -co-critical graphs. (Received January 16, 2021)