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Solving the clique cover problem on (bull, C_4)-free graphs

For the class of (bull, C_4)-free graphs, a largest clique can be found in polynomial time, but stability number and chromatic number are NP-hard. We give a polynomial-time algorithm to find a minimum clique cover of a (bull, C_4)-free graph, or equivalently, a minimum colouring of a (bull, $2K_2$)-free graph. (Bull, $2K_2$)-free graphs are AT-free. The complexity of colouring AT-free graphs is a long-standing open problem, although Stacho has given a polynomial-time algorithm for 3-colouring them and Kratsch and Müller have given a polynomial-time algorithm for k -colouring them for fixed k . This is joint work with Chính T. Hoàng.