Student Research Talks (StReeTs)

Department of Mathematics, George Mason University

Complementation, Switching and Local Complementation in Binary Matroids

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Abstract

In 2004, Ehrenfeucht, Harju, and Rozenberg showed that any graph on a vertex set V can be obtained from a complete graph on V via a sequence of the operations of complementation, switching edges and non-edges at a vertex, and local complementation. The last operation involves taking the complement in the neighborhood of a vertex. In this talk, we consider the natural generalizations of these operations for binary matroids. We characterize all binary matroids obtainable from the binary projective geometry of rank r under the operations of complementation and switching. Moreover, we show that not all binary matroids of rank at most r can be obtained from a projective geometry of rank r via a sequence of the three generalized operations. We introduce a fourth operation, pointed swaps, and show that, with this additional operation, we are able to obtain all binary matroids. This is joint work with James Oxley.

Date: Friday, November 20, 2020
Time: 2:30pm–3:20pm
Place: See https://streets-gmu.wikidot.com/ for zoom link

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