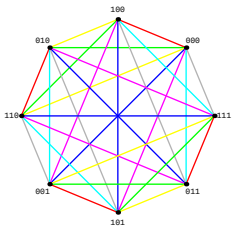
Discrete Mathematics and Optimization Seminar

W2003



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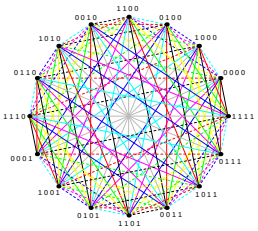

January 27 (Monday), 16:45 – 17:45, Burnside Hall 1205

Transversals of Additive Latin Squares

by

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Abstract. In this talk I address the following problem: When does every square submatrix of the Cayley addition table of an Abelian group contain a Latin transversal? In other words, given two subsets $\{a_1, a_2, \ldots, a_k\}$ and $\{b_1, b_2, \ldots, b_k\}$ of an Abelian group, when is it possible to find a permutation $\pi \in S_k$ such that the elements $a_1 + b_{\pi(1)}, a_2 + b_{\pi(2)}, \ldots, a_k + b_{\pi(k)}$ are all different?

This is obviously true in every ordered Abelian group. Hence, for k fixed, the result can be extended to every finite Abelian group whose order is not divisible by small prime numbers. According to a conjecture of Snevily the result holds in every Abelian group of odd order. Extending a method of Alon, Nathanson and Ruzsa, we verify this conjecture for cyclic groups. This method, often referred to as the 'polynomial method', has applications not only in the additive theory but also in graph theory and geometry. In our case it enables us to reduce the problem to the study of permanents of certain Vandermonde matrices.

Organizers: D. Avis(CS), W. Brown(Math), D. Bryant(CS/Math), L. Devroye(CS), K. Fukuda(CS), B. Reed(CS), V. Rosta(Math), G. Toussaint(CS) and S. Whitesides(CS).
Information: http://www.cs.mcgill.ca/~fukuda/semi/discmath.html