Combinatorial Designs, Codes and Graph Factors

ATIF ABUEIDA, University of Dayton

The spectrum of non-polychromatic equitable edge colored Steiner Triple Systems

A $STS(v)$ is called polychromatic if the edges of every triple in the $STS(v)$ is colored with three different colors. We discuss the relation between equitable k-edge coloring of K_v and polychromatic $STS(v)$ when $2 \leq k \leq v-2$. This is joint work with James Lefevre and Mary Waterhouse.

MELISSA KERANEN, Michigan Technological University

GDDs with two groups and block size 6 with fixed block configuration

A $GDD(n, 2, k; \lambda_1, \lambda_2)$ has fixed block configuration (s, t) if each block has exactly s points from one group and $k - s = t$ points from the other. We give new results on the existence of $GDD(n, 2, 6; \lambda_1, \lambda_2)$s with fixed block configurations $(3, 3)$, $(4, 2)$ and $(5, 1)$. (Joint work with Melanie Laffin.)

NIDHI SEHGAL, Auburn University

6-cycle system of the cartesian product $K_x \times K_y$ covering 2-paths in $K_{x,y}$

A cycle in $G_1 \times G_2$ is said to be *fair* if it has atmost two vertices in each row and in each column. Notions of *fairness* in graph decompositions have arisen in various forms, such as *equitable* and *gregarious* decompositions. In this talk, we give necessary and sufficient conditions, and the required constructions to obtain a *fair* (C_6, P_2) 1-covering of $K_s \times K_t$ which yields a (C_6, P_3) 1-covering of $K(S, T)$.

PADMAPANI SENEVIRATNE, American University of Sharjah

Codes from multipartite graphs and permutation decoding

We examine the self orthogonal codes associated with the row-span of incidence matrices and the adjacency matrices of complete multi-partite graphs and we show that, these codes contain permutation decoding sets or PD-sets for full-error correction. Further we study the computational complexity of the permutation decoding method.

CHINA VENKAIAH VADLAMUDI, C R Rao Advanced Institute of Mathematics, Statistics, and Computer Science

Sequentially Perfect 1-Factorization and Cycle Structure of Patterned Factorization of K_{2^n}

In this paper, a new method to construct a 1-factorization of a complete graph of order 2^n is proposed. Novelty of the method is that the 1-factorization that it produces is sequentially perfect and is at times perfect. Also, a set of 1-factors of the 1-factorization are always pairwise perfect. These perfect pairs can be identified using the gcd computation. The paper also analyzes the cycle structure of the patterned 1-factorization via the proposed 1-factorization.