

Combinatorial problems motivated by coding theory

A family of subsets of an n -set is r -cover-free, if no set is covered by the union of r others. To determine the maximum size $f(n, r)$ of such a family seems to be hard, it is an open problem since five decades. On the other hand, this problem has many applications in coding theory, geometry and theoretical computer science. In 1994 I gave a combinatorial proof for the best known upper bound and after 25 years I decided to get back to it. I am inviting students who like adventures for this project.

Prerequisites: basic combinatorics and probability theory.

Best for: students interested in combinatorics, discrete mathematics, computer science or information theory.

Professor: Dr. Miklós Ruszinkó.

Assignment for the first week: read and try to digest the linked papers.