A few interesting problems on Boolean and vectorial functions

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Abstract

In this talk, I will describe a few problems on (n, m)-functions, $1 \leq m \leq n$, on which I am currently working and collaborating:
- Constructions of nonlinear Boolean functions (with Palash Sarkar, India),
- A generalized indirect sum construction (with Deng Tang, China),
- On the algebraic degree stability of Boolean and vectorial functions when restricted to affine spaces (with Ana Salagean and Serge Feukoua, UK),
- On the Walsh supports of Boolean functions (with Marek Broll, Germany, and Pierrick Méaux, Luxembourg),
- Quadratic-like balanced functions and permutations (with Irene Villa, Italy),
- Affine spaces over which the inverse function sums to 0 (with Xiang-Dong Hou, USA),
- On the weight distribution of the $RM(m-3, m)$ codes (with Mikhail Lobanov, Russia),
- Identifying codewords in Reed-Muller codes and their weights.