Abstract

Combinatorics of minimal codewords of binary codes

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It has been widely known that Maximum Likelihood Decoding for binary linear codes can be regarded as an integer programming with binary arithmetic conditions. Conti and Traverso [CoTr91] have proposed an efficient algorithm which uses Gröbner bases to solve integer programming with ordinary integer arithmetic conditions. Ikegami and Kaji [IkKa03] extended the Conti-Traverso algorithm to solve integer programming with modulo arithmetic conditions. It is natural to consider for those problems the Graver basis associated to them which turns to be the minimal cycles of the binary matroid associated to the code (i.e. minimal codewords) and its geometry. This provides us an universal test set that allow us gradient decoding in those codes related to the test set stated in [BBMF08]. In this talk we will center our study in the results concerning some graphic codes associated to finite undirected graphs.

References

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