

Signature codes for weighted binary adder channel and multimedia fingerprinting

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In this paper, we study the binary signature codes for weighted binary adder channel and collusion-resistant multimedia fingerprinting. Let $A(n, t)$ denote the maximum cardinality of a t -signature code of length n , and $A(n, w, t)$ denote the maximum cardinality of a t -signature code of length n and constant weight w . First, we show a necessary condition for t -signature codes and then derive an asymptotic upper bound for $A(n, t)$, that is, for sufficiently large n and t , $\log_2 A(n, t) \leq (1/2 + o(1))(n \log_2 t)/t$. Next, we prove that a 2-signature code of constant weight 2 is equivalent to a corresponding C_4 -free graph, yielding $A(n, 2, 2) = (1/2 + o(1))n^{3/2}$ for sufficiently large n . By investigating the extremal property of 2-signature codes of constant weight 3, we obtain $A(n, 3, 2) \leq n(n-1)/3$. Furthermore, we provide two explicit constructions for t -signature codes which have efficient tracing algorithms for multimedia fingerprinting.

Keywords: weighted binary adder channel, multimedia fingerprinting, signature code