ON INTERACTIVE COMMUNICATION [3]

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Abstract

Almost two decades ago Ahlswede introduced an abstract correlated source $(\mathcal{V}\times\mathcal{W},\mathcal{S})$ with outputs $(v,w)\in\mathcal{S}\subset\mathcal{V}\times\mathcal{W}$, where persons $P_\mathcal{V}$ and $P_\mathcal{W}$ observe v and w, resp. More recently Orlitsky considered the minimal number C_m of bits to be transmitted in m rounds to "inform $P_\mathcal{W}$ about v over 1 channel". He showed that $C_2\leq 4C_\infty+3$ and that generally $C_2\not\sim C_\infty$. We give a simpler example than Zhang and Xia for $C_3\not\sim C_\infty$. However, for the new model "inform $P_\mathcal{W}$ over 2 channels" 4 rounds are optimal for this example — a result, we conjecture in general. If both, $P_\mathcal{V}$ and $P_\mathcal{W}$, are to be informed over 2 channels about the other outcome, we determine asymptotically the complexities for all sources. In our last model "inform $P_\mathcal{V}$ and $P_\mathcal{W}$ over 1 channel" for all sources the total number T_2 of required bits is known asymptotically and T_∞ is bounded from below in terms of average degrees. There are exact results for several classes of regular sources. An attempt is made to discuss the methods of the subject systematically.