COMBINATORIAL SEARCH AND COMMUNICATION COMPLEXITY

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The lecture is about a special type of Combinatorial Search in which one doesn't have to find the hidden element x itself, but only the value $f(x)$, for a fixed function f.

A set H of n elements, a set system $\mathcal{A}$ on H and a Boolean function f on H are given. Someone chooses an element $x \in H$, and we may ask questions of the following type: is x contained in $S \in \mathcal{A}$? Our aim is to find the value $f(x)$ from as few questions as possible. This type of search is well–known, but rather few results are published.

After some general ideas a family of set systems will be introduced by generalizing Yao's model of Communication Complexity, for which the problem is interesting and may well be applied in other search and communication questions, and several theorems will be proved about search using a set system of this family.