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Informative aspects in Approximation Theory and Complexity of recovery Problems

Let $X = (X, \rho)$ be a metric space, X' is the set of defined on X continuous functionals, $M_N = \{\mu_1, \mu_2, \ldots, \mu_N\} \subset X'$ and for $x \in X$ $M_N(x) = \{\mu_1(x), \mu_2(x), \ldots, \mu_N(x)\}$. Minimal error of recovery for $x \in \mathfrak{M} \subset X$ is

$$\gamma^N(\mathfrak{M}, X) = \inf_{M_N \subset X'} \sup\{\rho(x,y) : x, y \in \mathfrak{M},\, M_N(x) = M_N(y)\}.$$

We consider the following problems.
a) Informativeness of set $M_N \subset X'$ as a measure of decrease of the uncertainty domain for $x \in \mathfrak{M}$ at the expense for $M_N(x)$.
b) Adaptive method of successive choice of functionals when by the select functional μ_K we take into account $\mu_1(x) \ldots \mu_{K-1}(x)$.
c) Complexity of the approximation problem as minimal quantity of ressources which is necessary for recovery element x with defined exactness.
Concerning of form of the information we take following two postulates: value informative operator is number vector $\{c_1, c_2, \ldots, c_N\} \subset R^N$ and informative operator is continuous.
Let X, Y are metric space, $\mathcal{A}$ is set of continuous operators from X to Y. If elements $x \in X$, $y \in Y$, $A \in \mathcal{A}$ put in touch with equality $Ax = y$ then information about two from they determine the uncertainty domain for third. We consider three problems of the recovery in the general case and in the case when $Ax = \int_0^1 K(t,u)\, x(t)\, dt$.