

Research Interests

- Characterizations for the existence of an extension of a linear operator, bounded from above by a given convex operator P , and bounded from below by a given concave operator Q , P and Q being defined on arbitrary convex subsets of a real vector space. As a particular case (when one of these subsets is a convex cone), one can obtain generalizations of some classical results of H. Bauer, I. Namioka, H. Schaefer. Some other generalizations of Hahn-Banach type results are derived. Such type results on preordered linear spaces lead to solutions of two abstract moment problems, one of them being a Markov-type moment problem involving two given linear operators. These operators define the constraints on the solution. The other one is also a moment problem with two constraints, the "dominating" operator P being convex. The latter operator controls the norm of the (linear) solution (recall that the solution is a linear functional (or operator) which must satisfy the interpolation moment conditions).
- Mazur-Orlicz theorem and moment problems in concrete spaces.
- Any convex operator defined on a convex bounded finite dimensional subset, taking values into an order complete vector lattice, is bounded from below (see paper no. 2 from the list of selected articles).
- Elements of theory of topological ordered vector spaces, applied to concrete spaces of functions and self-adjoint operators. Operator-valued Markov type moment problems.
- Applications to the moment problem of a general theorem involving a convex subset which is distanced with respect to a vector subspace.
- A "construction" of the global inverse of a "strictly monotone" convex operator with applications to the construction of the "strictly decreasing" solution of an operatorial or functional equation, formulated implicitly (the real case). The complex case of such a functional equation: analyticity of the nontrivial solution.
- Some integral formulae, with an application to approximation theory, and further applications to the Markov moment problem on $[0, \infty)$.
- Applications of the solutions of the abstract moment problems to concrete moment problems in spaces which are not related to polynomials.
- Sandwich type theorems, on unbounded finite - simplicial convex subsets.
- Elements of uniform approximation of continuous functions on \mathbf{R}^n by $C^\infty - \sigma$ -step functions.
- An implicit function theorem for convex (not necessarily differentiable) functions, in which the "unknown function" can be "constructed" and it is "globally" defined.
- Some applications of elementary analysis to algebra and arithmetic.

- Variants of Newton's method for convex "strictly monotone" operators, with applications to concrete equations, when the "unknown" is a symmetric matrix or a self – adjoint operator. The connection with contraction principle.
- Elementary inequalities, Jensen-type inequalities related to the Gamma function.
- Applications of optimization and approximation theory. Polynomial approximation on unbounded finite dimensional closed subsets and related applications. Approximating the perimeter of an ellipse by means of a Leibniz series.
- Invariant subspaces and invariant balls of bounded linear operators. Characterizations in terms of quadratic applications (with vector coefficients), in several real dimensions, over unbounded subsets.
- Extension and decomposition of linear continuous operators dominated by sublinear continuous operators.