

Paolo d'Alessandro

## On Range Space Techniques, Convex Cones, Polyhedra and Optimization in Infinite Dimensions

This book is a research monograph with specialized mathematical preliminaries. It presents an original range space and conic theory of infinite dimensional polyhedra (closed convex sets) and optimization over polyhedra in separable Hilbert spaces, providing, in infinite dimensions, a continuation of the author's book:

A Conical Approach to Linear Programming, Scalar and Vector Optimization

Problems, Gordon and Breach Science Publishers, Amsterdam, 1997.

It expands and improves author's new approach to the Maximum Principle for norm optimal control of PDE, based on theory of convex cones, providing sharper results in various Hilbert space and Banach space settings. It provides a theory for convex hypersurfaces in  $l_p$  and Hilbert spaces. For these purposes, it introduces new results and concepts, like the generalizations to the non compact case of cone capping and of the Krein Milman Theorem, an extended theory of closure of pointed cones, the notion of beacon points, and a necessary and sufficient condition of support for void interior closed convex set (complementing the Bishop Phelps Theorem), based on a new decomposition of non closed non pointed cones with non closed lineality space.

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