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PREFACE

This special issue on Matrix Theory and Optimization is dedicated to Professor Adi Ben-Israel on the occasion of his 85th birthday.

Adi Ben-Israel is a Professor of Operations Research at Rutgers University, New Jersey, working in applied mathematics, optimization, statistics, operations research and other areas. Professor Ben-Israel has made significant contributions to geometry, matrix theory and optimization: generalized inverses of matrices and of operators, their extremal properties, computation and applications as well as local inverses of nonlinear mappings, the matrix volume and its applications, basic, approximate and least-norm solutions, the geometry of subspaces, ordered incidence geometry and the geometric foundations of convexity, the Newton method for systems of equations with rectangular or singular Jacobians, directional Newton methods, the quasi-Halley method, Newton and Halley methods for complex roots, the inverse Newton transform, linear programming, a Newtonian bracketing method of convex minimization, input optimization, risk modeling of dynamic programming, the calculus of variations, clustering and location theory, and decisions under uncertainty.

He is the author and co-author of four books and 130 scientific research papers. His work has had great impact on research in linear algebra and mathematical programming, as well as on a wide range of real-world applications. In this special issue we present papers authored by a selected group of experts in the areas of matrix theory and optimization. Most of the papers collected here have been contributed by former students, collaborators, friends and colleagues of Adi's, who were influenced by his scientific work.

The special issue contains twelve papers contributed by well-known experts in optimization and matric theory from Canada, Germany, Ireland, Israel, Taiwan and USA.

These papers cover a wide spectrum of important problems and topics of current research interest such as an eigenvector-based symmetric spectrum algorithm, the determination of the minimum number of distinct eigenvalues of a graph, projection methods for inconsistent feasibility problems, Newton-type methods for Fritz John systems of generalized Nash equilibrium problems, a derivative-free rooted tree method in nonconvex set optimization, diagonal realizability in the nonnegative inverse eigenvalue problem, integer completely positive matrices of order two, optimization of a Cauchy radius improvement, a smoothing alternating minimization-based algorithm for clustering with sum-min of Euclidean norms, complete positivity over the rationals, local Perron-Frobenius theory and geometry of local optima.

Therefore we feel that this special issue will be very valuable for many mathematicians who are interested in recent developments in matrix theory and optimization as well as their numerous applications.

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