Communications in Optimization Theory
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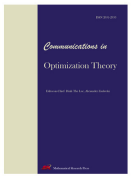

PREFACE
A SPECIAL ISSUE ON OPTIMAL CONTROL AND RELATED TOPICS DEDICATED TO THE MEMORY OF PROFESSOR JACK WARGA ON THE OCCASION OF HIS 100TH BIRTHDAY

Jack Warga was a Polish-born American mathematician who made fundamental contributions to optimal control, nonsmooth analysis, and optimization. He was born to a Jewish family in Warsaw, Poland, on September 20, 1922. In 1938 he was sent by his father to Belgium for his education and survived the Holocaust, while most of his family perished in Poland. In 1943, Jack arrived to the United States and participated in the war as an officer in the U.S. Army. After receiving his Ph.D. degree in mathematics from New York University in 1950, Jack worked in industry for sixteen years. He joined Northeastern University in 1966 as a professor of mathematics and remained there until his retirement in July 1993.

The contributions of Professor Warga to control theory and nonsmooth analysis is difficult to overstate. In 1962, working in industry, he developed the theory of generalized solutions to optimal control problems governed by ordinary differential equations and inclusions, introduced the notion of "relaxed controls" (this term, which is overwhelmingly used nowadays in control theory, was coined by Jack), proved existence theorems and necessary optimality conditions for relaxed controls, etc. Later on, he developed the theory of relaxed controls to general functional differential and integral differential systems. Professor Warga was a pioneer in the area of nonsmooth analysis, introducing in 1975 the notion of "derivative containers", which is among the most powerful and useful generalized derivative concepts for nonsmooth mappings. Warga's book "Optimal Control of Differential and Functional Equations" published in 1972 (translated into Russian in 1977), has been a source of deep knowledge and inspiration for several generations of mathematicians and applied scientists. During his scientific career, Professor Warga actively served the applied mathematics community at large. In particular, from 1964 to 1989 he was a member of the editorial board of SIAM Journal on Control and Optimization serving as the co-managing and managing editor of the journal from 1967 through 1978. Jack was an outstanding human being, very kind, friendly and supportive. Everyone who communicated with him will remember him forever.

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In this special issue, we present papers authored by a selected group of experts in the areas of optimization and control. The papers collected here have been contributed by colleagues of Professor Warga, who were highly influenced by his mathematical work. The special issue contains thirteen papers contributed by researchers from Algeria, Canada, France, Luxembourg, Israel, Italy, Japan, Portugal, Russia, USA. These papers cover a broad spectrum of important problems and topics of current research interest, including optimal control of a class of semi-linear systems on Banach spaces driven by vector measures and relaxed controls, pontryagin principle and envelope theorem, integro-differential sweeping process approach to frictionless contact and integro-differential complementarity problems, a dynamic programming approach to optimal pollution control under uncertain irreversibility, asymptotic analysis and open-loop solution of one class of partial cheap control zero-sum differential games with state and control delays, generalization of the elvis problem, investigation of singular regimens in a controlled model of psoriasis treatment, infinite-dimensional multiobjective optimal control in continuous time, differential characterization of quasi-concave functions without twice differentiability, reconstruction of an unknown disturbance in a system of differential equations based on measurements of phase states, non-occurrence of the lavrentiev gap for a bolza type optimal control problem with state constraints and no end cost, optimality conditions in discrete-time infinite-horizon optimal control problem with discounting, and near-optimal control of a stochastic sica model with imprecise parameters.

We hope that this special issue will serve as a source of ideas for many mathematicians, who are interested in new developments in optimization, control, and their applications.

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