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**OPTIMIZATION AND CONTROL  
WITH APPLICATIONS**

# Applied Optimization

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# **OPTIMIZATION AND CONTROL WITH APPLICATIONS**

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## Preface

The 34th Workshop of The International School of Mathematics G. Stampacchia, The International Workshop on Optimization and Control with Applications, was held during July 9-17, 2001 in Ettore Majorana Centre for Scientific Culture, Erice, Sicily, Italy. The Workshop was supported by Italian Ministry of University and Scientific Research, Sicilian Regional Government, The Hong Kong Polytechnic University and The National Cheng Kung University. The Director of The International School of Mathematics G. Stampacchia is Franco Giannessi. The Directors of the Workshop are Liqun Qi and Kok Lay Teo. They jointly organized the Workshop. About 90 scholars from as many as 26 countries and regions attended the Workshop. It consisted of 21 45-minute invited lectures, 45 30-minute contributed talks and 11 15-minute short communications.

This book contains 28 papers emitted from the Workshop. All papers were refereed. A special issue of *Journal of Global Optimization* containing 6 papers from the Workshop is also published.

The 28 papers are divided into four parts: Part I, Duality and Optimality Conditions, has 6 papers, Part II, Optimization Algorithms, has 9 papers, Part III, Optimal Control, has 8 papers, Part IV, Variational Inequality and Equilibrium Problems, has five papers.

One of the invited lecturers of the Workshop was Professor Elijah (Lucien) Polak, who is a legend in our community. As a survivor of the Holocaust, Lucien has made many significant contributions to optimization and control and their applications. Lucien was close to his 70th birthday during the Workshop. We decided to dedicate this edited volume to him.

We wish to take this opportunity to express our gratitude to Professor Franco Giannessi, the staff of Ettore Majorana Centre for Scientific Culture, and all speakers and participants for their contribution to the success of the Workshop. We would also like to thank Eva Yiu for the clerical work she provided for the workshop. We greatly appreciate the support from the referees of all submissions to this Special Issue for their reviews.

We are very happy to see that this Workshop has become a new conference series. This Workshop is now regarded as OCA 2001. During August 18-22, 2002, The Second International Conference on Optimization and Control with Applications (OCA2002) was successfully held in Tunxi, China. The Third International Conference on Optimization and Control with Applications (OCA2003) will be held in Chongqing-Chengdu, China, during July 1-7, 2003. Liqun Qi and Kok Lay Teo have continued to be the Directors of OCA 2002 and OCA 2003. We hope that OCA Series will continue to provide a forum for international researchers and practitioners working in optimization, optimal control and their applications to exchange information and ideas on the latest development in these fields.

Liqun Qi, Kok Lay Teo and Xiaoqi Yang  
The Hong Kong Polytechnic University

## Biographical Sketch of Elijah Polak



Professor Elijah Polak

Elijah (Lucien) Polak was born August 11, 1931 in Bialystok, Poland. He is a holocaust survivor and a veteran of the death camps at Dachau, Auschwitz, Gros Rosen, and Buchenwald. His father perished in the camps, but his mother survived. After the War, he worked as an apprentice blacksmith in Poland and a clothes salesman in France. In 1949, he and his mother migrated to Australia, where, after an eight year interruption, he resumed his education, while working various part time jobs.

Elijah Polak received the B.S. degree in Electrical Engineering, from the University of Melbourne, Australia, in 1957 and the M.S. and Ph.D. degrees,

both in Electrical Engineering, from the University of California, Berkeley, in 1959 and 1961, respectively.

In 1961 he married Ginette with whom he had a son and a daughter. At present, they have 5 grandchildren, of which two are beginning to show an interest in mathematics.

From 1957 to 1958 he was employed as an Instrument Engineer by Imperial Chemical Industries, Australia and New Zealand, Ltd., in Melbourne, Australia. He spent the summers of 1959 and 1960 as a Summer Student, with I.B.M. Research Laboratories, San Jose, California, and the Fall Semester of 1964 as a Visiting Assistant Professor, at the Massachusetts Institute of Technology. Since 1961, he has been on the faculty of the University of California, Berkeley, where he is at present Professor Emeritus of Electrical Engineering and Computer Sciences, as well as Professor in the Graduate School.

He was a Guggenheim Fellow in 1968 - 1969, at the Institut Blaise Pascal, in Paris, France, and a United Kingdom Science Research Council Senior Post Doctoral Fellow, at Imperial College, London, England, in 1972, in 1976, in 1979, in 1982, 1985, 1988, and in 1990.

His research interests lie in the development of optimization algorithms for computer-aided design, with applications to electronic circuit design, control system design, and structural design, as well as algorithms for optimal control and nonsmooth optimization.

He is the author or co-author of over 250 papers as well as of four books: *Theory of Mathematical Programming and Optimal Control* (with M. Canon and C. Cullum, 1970), *Notes of a First Course on Linear Systems* (with E. Wong, 1970), *Computational Methods in Optimization* (1971), and *Optimization: Algorithms and Consistent Approximations* (1997). In addition, with L. A. Zadeh, he co-edited *System Theory* (1969), and translated from the Russian *Absolute Stability of Regulator Systems*, by M. A. Aizerman and F. R. Gantmacher.

He is a Life Fellow of the Institute of Electrical and Electronic Engineers, a member of the Society of Industrial and Applied Mathematics and a member of the Mathematical Programming Society.

He is an Associate Editor the *Journal of Optimization Theory and Applications*, and of the *Journal of Computational Optimization and Applications*.

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