

PREFACE: SPECIAL ISSUE ON CONTROL, OPTIMIZATION AND PDE

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This special issue on Control, Optimization and PDE is dedicated to Professor Fredi Troltsch on the occasion of his 70th birthday.

Professor Troltsch is a German mathematician who made significant contributions to optimal control of partial differential equations and numerical methods for optimal control problems.

Fredi Troltsch was born in Dennheritz, Germany in 1951. He studied mathematics at Technical University Bergakademie Freiberg during 1969-1977 where he received his Ph.D. degree in 1977. He had Habilitation (Dr. sc. nat.) in 1982 at the same university. During 1983-2000 he worked as a university lecturer and an university professor at Chemnitz University of Technology. During October 2000 - March 2019 Fredi Troltsch served as an university professor of Technical University of Berlin.

Professor Fredi Troltsch has more than 150 papers and 2 books, and has supervised the work of 19 PhD candidates.

In this special issue we present papers authored by a selected group of experts in the areas of Control, Optimization and PDE. The papers collected here have been contributed by collaborators and colleagues of Fredi Troltsch, who were influenced by his mathematical work.

The special issue contains sixteen papers contributed by researchers from Brazil, Czech Republic, France, Germany, Israel, Italy, New Zeland, Poland, Romania, Russia, Spain, Ukraine and USA. These papers cover a wide spectrum of important problems and topics of current research interest, including optimal control of fractional PDE'S with state and control constraints, an adaptive projected Newton non-conforming dual approach for trust-region reduced basis approximation of PDE-constrained parameter optimization, optimal control of a phase field system of Caginalp type with fractional operators, optimal control of a Fisher-KPP type model arising in chemotherapy for brain tumors, Nash equilibrium in a singular infinite horizon two-person linear-quadratic differential game, on problems of dynamic optimal nodal control for gas networks, existence of optimal controls in the absence of weakly continuous control-to-state-operator, optimal control of non-convex rate-independent systems via vanishing viscosity the finite dimensional case, well-posedness and boundary observability of strongly degenerate hyperbolic systems on star-shaped planar network, on dynamical reconstruction of an input in parabolic equations, optimal control of non-smooth wave equations, implicit parametrizations in shape optimization: boundary observation, a penalty scheme to solve constrained non-convex optimization problems in $BV(\Omega)$, first-order conditions for the optimal control of the obstacle problem with state constraints, optimal control of flows of viscoelastic semi-compressible fluids, and on the numerical range of sectorial forms.

We hope that this special issue will serve as a source of ideas for many mathematicians, who are interested in pursuing recent developments in Control, Optimization and PDE.

Boris Mordukhovich, Boris Vexler and Alexander Zaslavski, Editors

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