

Foreword

I am deeply honored and pleased to write this foreword to the very timely and substantially relevant Special Issue on *Control, Shape and Topology Optimization for Distributed Parameter Systems, in celebration of the 75th birthday of Prof. Jan Sokolowski*, of the well-known and established journal, *Control & Cybernetics*, which has been published for a good couple of decades by the Systems Research Institute, Polish Academy of Sciences in Warsaw, Poland, in recent times in collaboration with Sciendo, a subsidiary of De Gruyter Online. The Journal has over the years become one of the most influential journals in its fields.

As it is the case with all special issues, their importance may be viewed from at least two points of view, or two aspects of relevance. First, there is the substantial aspect, as in virtually all such cases the special issues are concerned with some topics that are relevant for science and technology, and are often at the forefront of particular fields. The special issues are then meant to present both the most relevant developments and people. Second, there is a personal aspect of special issues, which can be both related to the people, who are the guest editors, and - very often - people to whom a particular special issue is dedicated and presented as a small token of appreciation by their peers and the research community. Clearly, the second aspect is also related to the people who have contributed as the authors of papers.

In the case of this Special Issue, we have an extraordinary example of what can be attained when all aspects mentioned above are satisfied to the highest degree.

First, starting from the most general aspect, which is reflected in the title and invocation of the Special Issue, namely: celebrating the 75th Anniversary of Professor Jan Sokołowski, it makes me very honored and happy. I have known Professor Sokołowski since the beginning of the 1970s. At that time, we have started our work as young research assistants and then PhD students for the Polish Academy of Sciences, then in the Institute for Engineering Cybernetics, which, in the process of renaming, has finally become the Systems Research Institute of the Academy.

During these first years at the Systems Research Institute, Polish Academy of Sciences, Professor Sokołowski has developed a deep interest in optimal control of systems described by partial differential equations, defended his PhD with summa cum laude, and started a close collaboration with the famous IRIA (then INRIA) institute in France. He has had a chance to collaborate with two famous French mathematicians, Professors Jacques-Louis Lions and Jean-Pierre Yvon. As it has turned out, this collaboration has been decisive for his later career and worldwide recognition, though he

has also had research stays at other top research and scholarly centers, notably in the USA.

Since 1994 he has been sharing his time between two top institutions, at which he has been employed, Université Henri Poincaré in Nancy, France, and the Systems Research Institute, Polish Academy of Sciences in Warsaw, Poland. He has built in both institutions research groups that have gained a very high international reputation. A rich list of publications in prestigious journals, edited volumes and conference proceedings, and books that have been (co)authored and (co)edited by Professor Sokołowski and members of his groups are the best proofs of his stature and his great research and scholarly leadership, as well as impact on the world community in his fields. To just mention a few examples, his numerous works on shape optimization and optimal control for systems described by partial differential equations belong to the most interesting and highly cited works in the world science in the fields concerned. In addition to very influential journal papers, he has also co-authored a couple of books. To be more specific, to just mention one example for what he is very well known all over the world, he has proposed with Professor Antoni Żochowski the concept of a topological derivative, which has found many applications for solving diverse problems in shape optimization, topology optimization, image processing, and many, many other areas.

Therefore, to briefly summarize the "personal aspect" of this Special Issue, it is devoted to a great scientist, who has contributed over many years with not only top-level research results, but also as a mentor and supervisors for many younger collaborators.

The second aspect mentioned in the beginning that should be taken into account while commenting upon any special issues is the substantial contents. Since a more detailed description of the contents and scope of the particular papers included is to be provided by the Guest Editors, then I will just very briefly comment upon the topics and authors involved from a more general point of view. First, one should emphasize that just at the first glance one can see that the topics of the papers included do correspond to the main fields at which Professor Sokołowski has attained a world class stature. These fields include mainly various aspects of optimal control of systems described by partial differential equations, shape optimization, topology optimization, etc. The authors of the contributions belong among the top specialists in the fields and are known worldwide for pioneering works, and - what is also important - have been for years close collaborators of Professor Sokołowski. They are also representatives of world class research groups in their respective fields. The authors come from different countries, even continents, and also include some top Polish researchers.

An important and interesting example of Professor Sokołowski's multifaceted contribution is the last (but not least!) paper in this issue, whose one of the authors is his PhD student from China, who is now completing her PhD under his supervision at the Systems Research Institute in Warsaw, Poland. His collaboration with the Chinese colleagues entailed an inspiration for a young researcher and then has helped her undertake this very ambitious project that has resulted not only in a good start for a valuable

PhD dissertation with a novel idea and technical contents, but also some journal and conference publications, which can certainly help the young PhD student regarding her career.

To conclude this very short foreword, I wish to express again that I have been very much honored and pleased to write these couple of words as a token of appreciation for Professor Jan Sokołowski, a great scientist and scholar, the author of so many novel concepts, approaches, tools and techniques, that have become well known in his fields, but also a mentor and supervisor for many young collaborators. Moreover, it makes me so much honored and happy because he has been a long-time friend of mine.

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