Preface

Interdisciplinary Research in Engineering: Steps towards Breakthrough Innovation for Sustainable Development

Technological progress has reached a point where disconnected researches rarely lead to major contributions in knowledge formation. Sustainable economic growth for welfare and prosperity is a major challenge for human kind. It requires a holistic view and analysis of every problem and a comprehensive approach for most systems' synthesis. From this perspective, formulation of mature solutions is a complex task. Various fields of activity and a broader range of competences are required to approach the problem.

Interdependencies occur in various ways; therefore, thinking across disciplines is almost a must condition to create adequate premises for the foundation of reliable solutions. From the simpler cases of associating various domains of scientific research and engineering to the more complex approaches of partial or even deep integration of knowledge and competences, people are invited to find new ways of organizing their work and alternative modes of collaboration and thinking such as to exploit better the intrinsic potential of background experience, know-how and expertise.

Engineering is one of the major fields where, nowadays, interdisciplinarity in research and development is a common issue. Almost every product we see today in the market is a combination of several engineering technologies. To move forward in technological development, we are challenged to reach new frontiers of research in engineering and explore new methodologies and methods that involve and chain a broader range of competencies. We need to break the psychological inertia and to look more and more for solutions in unfamiliar universes.

In the spirit of these ideas, the conference "Interdisciplinary Research in Engineering: Steps towards Breakthrough Innovation for Sustainable Development" has targeted the creation of a forum where both young and experienced researchers from various areas of engineering and applied sciences find a conductive environment to share results and experiences, as well as niches for interdisciplinary areas to create new things and reveal new knowledge.

The conference was organized by the Technical University of Cluj-Napoca, in cooperation with other two major technical universities, the "Politehnica" University of Timișoara and the "Gh. Asachi" University of Iași. Over 70 scientific papers have been finally selected for presentation and publication in this volume.

We would like to express our acknowledgement to all contributors of the papers presented in the conference, keynote speakers, all participants and sessions' chairs for their inputs to the success of this scientific event. Our grateful thanks are also directed to the conference organizing committee. As well, we express our sincere recognition to the publisher for its support throughout the publication stage.

We look forward with optimism and expect that the information in this book will meet the interest of some other people involved in research, education and industrial activities related to interdisciplinary engineering.

Cluj-Napoca, February 2013

Aurel VLAICU
Stelian BRAD
Chairmen of INTERIN 2013 Conference

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