
Editorial

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Biographical notes: Aleksandar Subic graduated with a BEng (Hons) Degree in Mechanical Engineering, MEngSci and a PhD from the University of Belgrade. He is currently the Chair in Mechanical Design and Head of Mechanical and Automotive Engineering at RMIT University in Melbourne and Director of the SAE-Australasia. He is the Editor-in-Chief of the *International Journal of Sustainable Design* and member of the Editorial Board of the *International Journal of Vehicle Design*. He has been the President of the International Sports Engineering Association (ISEA) from 2003 to 2007 and has founded and Chaired the Asia Pacific Congress series titled The Impact of Technology on Sport. He is internationally respected for his research in the field of sustainable engineering design focusing on sports and automotive technologies.

The mass production, consumption and waste present in industrialised and urbanised societies have had a profound effect on the planet's living systems and its vital resources. Already, many problems have emerged that highlight the need to consider the total system in which the economy, society and the environment are brought into harmony. It is evident that radical innovation both at technical and policy level will be needed in order to meet the significant challenges posed for example, by globalisation, climate change, growth in population and consumption, and natural resource depletion. Furthermore, this will require partnering between all stakeholders including government, business, industry, communities and consumers.

A number of important legislations, standards and reports dealing with sustainability and in particular environmental issues have been generated in recent years. They served as a catalyst for change across many industry sectors worldwide, providing strategy and scope for improvement. The systematic improvement of industrial products and services across the three main domains of sustainability (environmental, economic and social) is no longer an optional luxury. Sustainable solutions have become core elements of good governance and good business. In this context, design and innovation in particular have the potential to regenerate the natural environment and community culture while enhancing the value of products and services to business, customers and society in general. In order to meet the emerging scientific and technological challenges associated with the concept of sustainability, new design research is required that has the capacity to propose and achieve concrete sustainable solutions.

The new *International Journal of Sustainable Design* (IJSDes) is devoted to the development, promotion and coordination of the research and practice of sustainable design. This scholarly journal on sustainable design is both important and timely.

As the design professions and design education struggle to redefine themselves in a period of rapid change and considerable confusion, it will be critical that any new approaches and new solutions are inherently sustainable. This requires research, discourse, and debate. The *IJSDes* aims to provide a forum for this discussion.

More specifically, the *IJSDes* is an inter-disciplinary and trans-disciplinary journal that focuses on the theoretical and practical aspects of sustainable design. It aims to establish an effective channel of communication between design experts in academic and research institutions, professionals working in industry and related businesses, government agencies and policy-makers concerned with sustainability issues in design. The international dimension of the journal is emphasised in order to overcome cultural and national barriers and to meet the needs of accelerating technological and ecological change. In addition, the journal aims to enable researchers, practitioners and decision-makers to monitor and identify design strategies, solutions and trends on a global scale. The subject matter covered in the journal is considered highly relevant to engineers, scientists, manufacturers, architects, industrial designers, design managers and other researchers and professionals working in design and product development with a particular involvement with or interest in sustainability issues.

This inaugural issue of the *International Journal of Sustainable Design* presents eight papers that deal with different aspects and applications of sustainable design across different industry sectors. Stuart Walker in his paper titled 'Extant objects: designing things as they are' provides an introduction to this issue with a design exploration that addresses the re-use of low-value, discarded mass-produced objects. This exploration is an attempt to deal with a range of sustainability concerns associated with contemporary mass-produced material culture. Two distinct, but interrelated approaches to sustainable design are recognised and discussed using exploratory design examples involving consumer products. At the end of this paper, Walker summarises the main challenges that refer to the key sustainability concerns related to the discarding or re-use of products: accepting, valuing, moderating and slowing. The issues associated with sustainable design of consumer products are further discussed by Short and Harvey in their paper 'Lightbulbs and nappies: sustainable development and customer perceptions'. They explore in detail how consumer perceptions of 'green products' are developed and what the implications of this are for engineering designers. Schiavone et al. in the paper 'Strategy-based approach to eco-design: an innovative methodology for systematic integration of ecological/economic considerations into product development process' focus more specifically on the eco-design strategies and their integration in design and manufacture of automotive components. The process discussed in this work outlines the main principles and approaches to engaging all stakeholders that are involved with sustainable product development within an industry setting. The main framework for sustainable design is based on life cycle design. Often this approach is burdened by uncertainty due to the complexity of problems and incompleteness of data required. Duncan et al. in their paper titled 'An approach to robust decision making under severe uncertainty in life cycle design' introduce an info-gap decision theory (IGDT) approach to robust decision making in the context of environmental performance affected by life cycle uncertainty. Implications of IGDT to life cycle engineering design problems are discussed, as are potential limitations that could be encountered when solving more complex problems. Hanna and Subic consider sustainable design of sports products and services in their paper 'Towards sustainable design in the sports and leisure industry'. The sports products industry, like many of the consumer products manufacturing sector

has been operating very much on a disposal commodity basis. In case of sports products the manufacturing phase of the life cycle has the highest environmental impact. Indeed, many sports products require considerable amount of energy to manufacture, they exploit a wide range of materials and processes with little thought for recycling, re-use and sustainability in general. This paper examines the current economical, societal and technological trends relating to sports and leisure, and suggests concrete strategies and approaches towards sustainable design in this industry sector. Wimmer et al. in their paper 'Product innovation through ecodesign' also discuss eco-design strategies relating to sports products and other consumer products. They present industry case studies involving for example alpine skis and a new golf swing analyser, where particular design improvements are achieved in regard to design for environment using available methods and tools. Paper 'Hydrogen storage systems for automotive applications – Project StorHy' by Joerg Wellnitz presents the results of a collaborative EU research project focusing on the design of hydrogen storage tanks for passenger vehicles. Beside the technical requirements that hydrogen powered vehicles impose on such systems the paper also explores the broader sustainability criteria that is addressed in the design evaluation methodology using a multicriteria analysis approach. The final paper of this issue titled 'Design of passive cooling system for a building in composite climatic conditions in India' by Jyotirmay Mathur and Rajiv Kathpalia presents the design of a combined solar chimney and wind tower concept that has been developed for a typical urban office building in Delhi. Evolution of the final design taking into consideration a range of sustainable design criteria and constraints is explained and illustrated in this paper. The diversity of approaches and solutions summarised above reflect the trans-disciplinary nature of the journal and our intention to identify and communicate sustainable design propositions and solutions across a wide range of application areas. In this issue we feature applications from the consumer products industry, automotive, sports and leisure, and building services industry.

I gratefully acknowledge the authors, referees and members of the international Editorial Board who have made this first issue of the *IJSDes* possible with their invaluable contributions. I would also like to thank Inderscience for their ongoing support and commitment to promoting contemporary research in sustainable design. I hope that the journal will be of interest to researchers, practitioners and design enthusiasts in general whatever their background or persuasion. Finally, I acknowledge that much remains to be learned about sustainable design, and hope that the journal will play an important role on that journey of discovery.