Preface to the Special Issue on Statistical & Soft Computing Techniques For System Analysis and Design

Special Issue Guest Editors:

Dr. Ibrahiem M. M. El Emary
King Abdulaziz University, P.O. Box 18388, Jeddah, King Saudi Arabia
(email: omary57@hotmail.com)

Dr. S. Ramakrishnan
Information Tech. Dep., Dr.Mahalingam College of Eng. & Tech.,
Udumalai Road, Pollachi-642003, India
(email: ram_f77@yahoo.com, ramki@drmcet.ac.in)

Systems analysis and design is a significant area of research in computer science. In recent years, systems analysis and design practice has undergone a number of dramatic changes. Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending feasible suggestions for improving the system functioning. This involves studying the processes, gathering operational data, understand the information flow, finding out bottlenecks and evolving solutions for overcoming the weaknesses of the system so as to achieve the goals. System design is based on the specification and the detailed analysis of the existing system. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into physical system design.

Statistical & Soft Computing techniques have been popular in a variety of engineering disciplines, notably in electrical and computer engineering. Recent years have seen explosive growth in this area, driven by technological imperatives. These now go well beyond their traditional domain of queuing models and signal processing to novel methodologies deriving from a variety of areas such as random graphs, stochastic differential equations, classification and regression etc. These find applications ranging from artificial intelligence and manufacturing to bioinformatics.

These two techniques namely, Statistical and Soft Computing are the two important techniques that are widely used for system analysis and design. Despite its central importance, research in this multidisciplinary field gains relatively little attention. In order to fill this gap, this special issue aims to gather recent results in these broad areas of information processing and analysis that stems from statistical models and soft computing techniques. This is a multidisciplinary research field, with important connections with image, signal and speech processing, and robotics, to name only a few. Statistical and Soft Computing techniques are dedicated to system analysis and design. It provides rapid dissemination of important results in, parametric and non-parametric statistical techniques, a fusion of research in evolutionary algorithms and genetic programming, neural science and neural net systems, fuzzy set theory and fuzzy systems, and chaos theory and chaotic systems. Statistical and soft Computing encourages the integration of various techniques and tools into both everyday and advanced applications.

This special issue consists of five papers. The paper by Mona M. Abd El-Kareem presents use of linear programming for gamming theory and presents a few interesting case studies. The paper by V.R.Vijaykumar et al presents an interesting approach for removal of Gaussian noise and edge preservation techniques are also presented. The paper by A.Soundarrajan and S.Sumathi is on upcoming soft computing technique, particle swarm optimization, which is applied for autonomous power generating system. The paper is a review paper by Ibrahiem M. M. El Emary and S. Ramakrishnan, which present a comprehensive and critical review on various statistical modeling techniques for images. The paper by IONESCU Valeriu and ZAFIU Adrian presents architecture to reduce the cost and development time of prosthetic hand.

We are grateful to the authors and the referees whose commitment made this issue possible. The support of the IAENG is really tremendous which is to be appreciated greatly.