Computer processes and models play an important role in the modern economic world and it is critical that these processes be modelled and executed with a maximum of efficiency. The world, however, is a complicated place and the processes are subject to variations, constraints, and even attempts at manipulation by interested parties. It thus becomes important to model the processes mathematically but also look to see how the models apply to the real world. In this issue both aspects of the process are considered in a series of articles that consider a variety of processes.

Within the past decade particle swarm models of problem solving have played an increasingly important role in areas of computation involving issues of optimization. Using networked interactions of random guesses within a space of possible solutions, this technique has been shown to evolve into an efficient means of solving difficult optimization problems. In this issue we present two articles that consider this approach to evolutionary-based computation. In the first, S. N. Sivanandam and S. N. Deepa consider this technique in relation to genetical algorithm models for the solution of lower order system modelling used in control systems engineering. Dr. Sivanandam collaborates with P. Visalakshi, and A. Bhuvaneswari in a study of multiprocessor scheduling that involved a hybrid model that combined particle swarm techniques with simulated annealing algorithms. It was found that this new model was able to achieve near optimal results in an efficient and effective manner.

Chin-Tai Chen, and Juin-Han Chen also are concerned with efficiency, using mixed integer linear programming in the context of order promising process in manufacturing, allowing an efficient matching of resources and demand within constraints of time demand and availability. If manufacturing concerns are to meet the needs of their customers in an efficient manner, this type of scheduling problem needs to be solved effectively and efficiently and the type of technique examined by the authors allows this to be accomplished.

The quest for computerized efficiency must acknowledge the inevitable divergence of the computer models and the real world, making certain that variations not captured in the model do not significantly impede the modelled processes. In the paper of Goutam Kumar Saha, software is used to accommodate environmental faults, specifically errors due to electrical surges and transients, in a computer-controlled industrial system. This ability to adapt to the actual environment in which the process is occurring is as important as the mathematical modelling techniques, which seek theoretical ideal solutions. Computing is an applied science and this demands to take into consideration actual conditions.

The variations considered by Dr. Saha are natural, but with our increasing dependence on computers we also must take into consideration intentional human manipulation of information. This has particular relevance to image production. Although the manipulation of photographic images has always been possible, the ability to engage in that manipulation in a transparent manner has grown greatly with the emerging dominance of digitally transmitted
pictures. Because of the important role that such images play in modern life it has become important to develop means of identifying manipulations that may not be visible to naked eye examination. In Kh. Manglem Singh's paper, the authenticity of images transmitted on the internet is verified through the use of a digital signature. This technique can assure that the information we use is not only efficiently processed but also is accurate.

This issue considers what is one of the most basic issues with computers. We have all faced frustrations as poorly designed computer systems were unable to respond to the details of human needs. Efficient computer models are critical but they must also accommodate the realities, and even ethical limitations, of the actual world. An underlying theme of this issue involves the various aspects of this interface.

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