

GUEST EDITORIAL

Special Section: Evolutionary Design

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This issue of *AIEDAM* is the second in a series of three “mini” special issues on Evolutionary Design by computers. The papers continue the theme that began in Vol. 13, No. 3, 1999, of using Evolutionary Computation for design problems. The first paper by Eby, Averill, Punch and Goodman provides an excellent overview of the most recent work at Michigan State University on this subject. They describe their work on the optimization of flywheels by an injection island genetic algorithm, and show the importance of minimizing the computation time devoted to evaluation for such real-world applications.

The next paper, *Automatic Tuning of PID and Gain-Scheduling PID Controllers by a Derandomized Evolution Strategy* describes the use of an evolutionary algorithm for controller design. The authors of this interesting paper show how an evolution strategy can be used to perform accurate

controller optimization for a fan and plate system. Finally, *Evolutionary Optimization within an Intelligent Hybrid System for Design Integration* is the third paper in the ‘mini’ special issue. This exciting work describes a design system capable of supporting most of the stages in the design process, by integrating various intelligent techniques. The authors explain how genetic algorithms are used to optimize both design parameters and neural network parameters in the conceptual and detail design stages for gear design.

All three papers show the versatility and value of Evolutionary Computation for real-world design problems. Combined with the three papers in the previous special issue, and with the three to come in the final special issue next year, they form part of the growing field that looks set to dominate Artificial Intelligence and Computational Design over the coming years: Evolutionary Design by computers.