

SEI/ASCE Technical Committee on Optimal Structural Design

2001 ANNUAL REPORT

The Optimal Structural Design (OSD) Committee has 20 members and is chaired by Don Grierson, University of Waterloo, Ontario, Canada. The secretary of the committee is Colby Swan, University of Iowa, Iowa, USA.

The OSD Committee held its Annual Meeting on May 22 at the 2001 Structures Congress in Washington, at which it sponsored 2 technical sessions. Namely: *Life-cycle safety and cost management of aging civil infrastructure systems* (Frangopol/ Furuta); *Computer-based conceptual design of structures* (Grierson/ Swan)

The OSD Committee is sponsoring three technical sessions at the 2002 Structures Congress in Denver. Namely: *Computational methods for performance-based design* (Grierson); *Practical design optimization applications using genetic algorithms* (Furuta); and *Lifetime performance prediction of structural systems and optimal maintenance planning* (Frangopol).

The OSD Committee has proposed four technical sessions for the 2003 Structures Congress in Seattle. Namely: *Optimization for nonlinear structural behaviors* (Ohsaki/ Swan); *Optimal conceptual design of engineered structures* (Grierson); *Tutorial: structural optimization – applications* (Arora); *Performance-based design optimization* (Foley/ Pezeshk).

Under the editorship of Scott Burns, the OSD committee is completing its work on a report on *Recent Advances in Optimal Structural Design*, a review of recent literature over the past ten years or so. The chapters for the publication include: Chp.1 *Methods for Discrete Variable Structural Optimization* (Arora); Chp.2 *Decomposition Methods in Structural Optimization* (Balling); Chp.3 *State of the Art on the Use of Genetic Algorithms in Design of Steel Structures* (Pezeshk/ Camp); Chp.4 *Conceptual Design Optimization of Engineered Structures* (Grierson/ Khajepour); Chp.5 *Topology and Geometry Optimization of Trusses and Frames* (Ohsaki/ Swan); Chp.6 *Evolutionary Structural Optimization* (Xie/ Yang/ Liang/ Steven/ Querin); Chp.7 *Design and Optimization of Semi-Rigid Framed Structures* (Xu); Chp.8 *Optimized Performance-Based Design for Buildings* (Foley); Chp.9 *Multiobjective Optimum Design of Seismic-Resistant Structures* (Cheng); Chp.10 *Reliability- and Cost- Oriented Optimal Bridge Maintenance Planning* (Frangopol/ Miyake/ Kong/ Gharaibeh/ Estes); Chp.11 *References* (Burns). The committee reviews of the final-draft versions of the chapters were submitted to Scott Burns in the latter half of 2001, and it is expected that publication of the manuscript as an ASCE Report will occur in 2002.

The OSD Committee sponsored a Technical Track (chaired by Shahram Pezeshk), a Workshop (chaired by Scott Burns) and a Tutorial (chaired by Don Grierson) on the theme of 'Optimal Structural Design' at the GECCO-2001 Conference on Genetic and Evolutionary Computation, San Francisco, July 7-11, 2001.

The OSD Committee will sponsor a Tutorial (chaired by Don Grierson) on 'Optimal Structural Design' at the GECCO-2002 Conference on Genetic and Evolutionary Computation, New York, July 9-13, 2002.

Two new members joined the OSD Committee in 2001 (Dr. Siavash Khajehpour Kinectrics, Toronto, Canada, and Professor Warren Lucas of Brigham Young University). Two previous members rejoined the committee after an absence of a year or more (Arora and Pezeshk). One new applicant is awaiting confirmation as a committee member (Professor Vlasis Koumoussis of the National technical University of Athens, Greece). The terms of eight members of the committee were extended for one year to 2002 (Estes, Frangopol, Burns, Hernandez, Swan, Xu, Truman and Grierson). The terms of two members came to an end in 2001 and they will become "Friends" of the committee (Rajan and Iordanescu).

Submitted by: Don Grierson, University of Waterloo, Canada
Chair, Technical Committee on Optimal Structural Design