

OPTIMIZATION UNDER UNCERTAINTY OF NONLINEAR AND/OR TRANSIENT PROBLEMS IN STRUCTURAL AND FLUID MECHANICS

TRACK NUMBER 1300

**BENEDIKT KRIEGESMANN^{*}, THOMAS RUNG^{*}, ROBERT SEIFRIED^{*},
ALEXANDER DÜSTER^{*}, KATHRIN WELKER[†], WINNIFRIED WOLLNER[#]**

^{*} Hamburg University of Technology
Am Schwarzenberg-Campus 1, 21073 Hamburg, Germany
www.tuhh.de/sensus

[†] TU Bergakademie Freiberg
Akademiestr. 6, 09599 Freiberg, Germany
Kathrin.Welker@math.tu-freiberg.de

[#] Universität Hamburg
Bundesstr. 55, 20146 Hamburg, Germany
www.math.uni-hamburg.de

Key words: Optimization, Uncertainty, Robust Design, Computational Mechanics, Fluid Dynamics.

ABSTRACT

Design optimization in structural mechanics and fluid dynamics is nowadays widely applied in academia and industry. However, most applications in industry still utilize linear models on the simulation side. Optimization of highly dynamic and/or nonlinear phenomena, the consideration of Multiphysics and the treatment of uncertainties is still a challenge. These challenges result for instance from the need for mesh regularization, less reliable convergence of optimization algorithms, and the very high computational cost associated with nonlinear transient and/or uncertain problems.

This mini-symposium aims to bring together experts in the field of shape or topology optimization with applications in fluid dynamics, structural mechanics and dynamics as well as coupled problems. The goal is to exchange ideas and discuss the latest achievements on efficient optimization strategies for nonlinear problems, dynamical systems, optimization under uncertainty, and for novel approaches to CAD-free shape optimization methods.