Report

(1) Name of Lecturer: Vassili V. Toropov

(2) Position: Professor of Aerospace Engineering

(3) Affiliation: School of Engineering and Materials Science, Queen Mary University of London

(4) Short Biography: Prof. Vassili V. Toropov is a Professor of Aerospace Engineering in School of Engineering and Materials Science at Queen Mary University of London. He is a top specialist of engineering design optimization and his research interests are in approximation techniques for design optimization, interaction of variable fidelity models, response surface methodology, genetic algorithms, genetic programming, inverse problems, applications to industrial problems, and so on. He is one of the executive committee members of The International Society for Structural and Multidisciplinary Optimization (ISSMO), and he is a co-editor of Structural and Multidisciplinary Optimization Journal (Springer).

(5) Subject and Schedule of the Lectures: This series of lectures is a part of the course "Optimization of Structural and Process Design" in Department of Mechanical Science and Engineering, Graduate School of Engineering. The lectures in English are intended to give appreciation of a need for design improvement, understanding of what the most useful design optimization techniques are and appreciation of how they can be used to improve designs. Details of the lectures are as follows:

Tue. 24th Nov., 2015, 08:45−10:15, 10:30−12:00 and 14:35−16:05 at Room A3−132
> Overview of the design process, basic concept of design optimization, classification of structural optimization problems, formulation of a design improvement problem as an optimization problem, and optimality conditions are explained.

Wed. 25th Nov., 2015, 10:30−12:00 and 16:20−17:50 at Room A3−451
> Multi−objective problems, optimization techniques for one−dimensional/multi−dimensional cases, and gradient−free/gradient−based optimization techniques for unconstrained/constrained optimization problems are explained. Genetic algorithm and its application examples are also introduced.

Thu. 26th Nov., 2015, 08:45−10:15 at Room A3−451
> Session for questioning and discussion. Students asked some questions to the professor, and discussed their interests with the professor.

Fri. 27th Nov., 2015, 10:30−12:00, 12:50−14:00 and 14:50−16:05 at Room A3−132
> Topology optimization, approximation techniques and stochastic optimization are the main topics. A fully stressed design, topology optimization and its use in structural design are explained. Approximation techniques and design of experiments (DoE) for optimization problems are also explained. Finally stochastic analysis and stochastic design optimization for uncertainties in design are introduced.

(6) Comments: A total of about 15 students participated in this lecture. The lecture must have broadened students' horizons. The students understood that if optimization techniques were used more and more in industries, it would give them a competitive advantage.