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Jakub Venclovský obtained his master's degree in 2014, in the field of mathematics applied in engineering at the Faculty of Mechanical Engineering. Since then, he is a PhD. student at the Faculty of Civil Engineering, Brno University of Technology. He published more than 15 scientific papers and led 3 junior research projects about optimization of reinforced concrete elements, originally focusing on the deterministic optimization and subsequently on the stochastic optimization. Also, topic of his PhD thesis focuses on the latter subject.

## FULLY PROBABILISTIC OPTIMIZATION OF REINFORCED CONCRETE ELEMENTS USING HEURISTIC ALGORITHM AND NEURAL NETWORK

Main aim of the contribution is to present an algorithm for stochastic optimization of design of steel-reinforced concrete element's cross section. Firstly, the deterministic problem is introduced and described, followed by the description of uncertainties involved in the process and stochastic reformulation of the problem. Afterwards, the algorithm itself, consisting of 2 cycles, is presented. The first, internal cycle consists of deterministic optimization using reduced gradient method followed by probability assessment using neural network on Monte Carlo simulation. The second, external cycle uses regression analysis for stochastic optimization. The paper concludes with presentation of the performed calculations and their results.

