

# Estimation of River Bathymetry Using the Global Optimization Algorithms.

Luděk Bureš, Radek Roub, Petr Máca, Pavel Pech  
Czech University of Life Sciences Prague

buresl@fzp.czu.cz, roub@fzp.czu.cz, maca@fzp.czu.cz, pech@fzp.czu.cz

## Abstract

The evaluation of values of parameters for river bathymetry surface plays a crucial role in hydrodynamic modeling process. The presented contribution provides an analysis of chosen of global optimization algorithms, which were used for finding the solutions of inverse problems, related to the parameters of mathematical models of river bed surfaces. The tested global optimization schemes were based on heuristics inspired by the natural processes. Selected versions of non-adaptive and self adaptive differential evolution, particle swarm optimization and other hybrid algorithms were applied. The presented analysis discusses the recommendations on selection of suitable optimization algorithm for inverse modeling of the river bed bathymetry.

## References

1. P. MACA AND P. PECH AND AND J. PAVLASEK. Comparing the Selected Transfer Functions and Local Optimization Methods for Neural Network Flood Runoff Forecast. *Mathematical Problems in Engineering*, vol. 2014, Article ID 782351, 10 pages, 2014.
2. M. JAKUBCOVÁ AND P. MÁCA AND AND P. PECH. A Comparison of Selected Modifications of the Particle Swarm Optimization Algorithm. *Journal of Applied Mathematics*, vol. 2014, Article ID 293087, 10 pages, 2014.
3. M. JAKUBCOVÁ AND P. MÁCA AND AND P. PECH. Parameter Estimation in Rainfall-Runoff Modelling Using Distributed Versions of Particle Swarm Optimization Algorithm. *Mathematical Problems in Engineering*, vol. 2015, Article ID 968067, 13 pages, 2015.
4. P. MACA AND P. PECH. The Inertia Weight Updating Strategies in Particle Swarm Optimisation Based on the Beta Distribution. *Mathematical Problems in Engineering*, vol. 2015, Article ID 790465, 9 pages, 2015.