

LITHUANIAN COMPUTER SOCIETY
VILNIUS UNIVERSITY
INSTITUTE OF DATA SCIENCE AND DIGITAL TECHNOLOGIES
LITHUANIAN ACADEMY OF SCIENCES



11th International Workshop on
**DATA ANALYSIS
METHODS FOR
SOFTWARE
SYSTEMS**

Druskininkai, Lithuania, Hotel "Europa Royale"
<http://www.mii.lt/DAMSS>

November 28–30, 2019

VILNIUS UNIVERSITY PRESS

Vilnius, 2019

Co-Chairmen:

Dr. Saulius Maskeliūnas (Lithuanian Computer Society)

Prof. Gintautas Dzemyda (Vilnius University, Lithuanian Academy of Sciences)

Programme Committee:

Prof. Juris Borzovs (Latvia)

Prof. Albertas Čaplinskas (Lithuania)

Prof. Robertas Damaševičius (Lithuania)

Prof. Janis Grundspenkis (Latvia)

Prof. Janusz Kacprzyk (Poland)

Prof. Ignacy Kaliszewski (Poland)

Prof. Yuriy Kharin (Belarus)

Prof. Tomas Krilavičius (Lithuania)

Prof. Julius Žilinskas (Lithuania)

Organizing Committee:

Dr. Jolita Bernatavičienė

Prof. Olga Kurasova

Dr. Viktor Medvedev

Laima Paliulionienė

Dr. Martynas Sabaliauskas

Contacts:

Dr. Jolita Bernatavičienė

jolita.bernatavicienne@mif.vu.lt

Prof. Olga Kurasova

olga.kurasova@mif.vu.lt

Tel. +370 5 2109 315

Copyright © 2019 Authors. Published by [Vilnius University Press](#)

This is an Open Access article distributed under the terms of the [Creative Commons Attribution Licence](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

<https://doi.org/10.15388/Proceedings.2019.8>

ISBN 978-609-07-0325-0 (digital PDF)

© Vilnius University, 2019

Simulation-Based Multi-Objective Optimization Methods for Business Process Optimization

Aleksandr Širaliiov, Olegas Vasilecas

Institute of Data Science and Digital Technologies
Vilnius University
aleksandr.siraliiov@mif.vu.lt

Business process optimization (BPO) is the focus of all successful business companies. Optimization, itself, is known as the process of finding the best solution from all feasible solutions. Simulation-based BPO is an instrument for detailed analysis of processes and further optimization. Various simulation optimization methods, which is understood as simulation-based optimization, are available. It is not obviously clear which optimization method or group is most applicable for BPO. This paper discusses the simulation optimization methods for BPO. Different simulation optimization approaches have been provided in the related papers, however evolutionary algorithms and in specific genetic algorithms are widely used for BPO. Challenging in BPO becomes apparent when solving problems simultaneously against multiple objectives that conflict to each other. Multi-objective optimization involves optimizing a number of objectives simultaneously and evolutionary algorithms are successfully used to solve related problems. One of the objectives of the paper is to provide sufficient information about simulation optimization and with which methods it is used for BPO. In the field under discussion, it also is a challenge to understand the relation between different terms, such as, Business process optimization, Business process simulation, Multi-objective optimization, Multi-criteria optimization, Simulation optimization, Evolutionary algorithms, Genetic algorithms. Due to large amount of the terms and in some case with very similar wording, it is highly important to use them in proper and precisely way. For that reason, as next objectives of the paper, the explanations of such relations as well as meanings of terms are provided. In our days, market is suggesting some simulation optimization software and it becomes challenging

to choose the best fit. The brief comparison of simulation optimization software is also available in the paper. Some ideas how to prepare and run simulation-based multi-objective optimization method for BPO has been presented in the paper. The experiments with BPO, have been conducted with simulation optimization software, will be done and the results will be described in the paper. In the end of the paper, conclusions are listed and what assumptions might be addressed in the future studies. Nevertheless, it is necessary to continue research in the area of the simulation-based BPO to achieve all research objectives and overcome all challenges.