Anita Varga

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Personal information

Date of birth: July 3, 1992.
Place of birth: Debrecen, Hungary
Citizenship: Hungarian
E-mail address: vanita@math.bme.hu

Education

Budapest University of Technology and Economics Budapest, Hungary
Doctoral School of Mathematics and Computer Science September 2018 – Present
PhD Student
Research topic: Interior point methods for special convex optimization problems
Supervisor: Marianna E.-Nagy

Budapest University of Technology and Economics Budapest, Hungary
MSc in Applied Mathematics September 2014 – June 2016
Specialization: Operations Research
Thesis: Integrating combinatorial algorithms into a linear programming solver
Supervisor: Richárd Molnár-Szipai

Budapest University of Technology and Economics Budapest, Hungary
BSc in Mathematics September 2011 – June 2014
Thesis: Approximations for the quadratic assignment problem
Supervisor: Marianna E.-Nagy

Research interests

Linear and convex optimization theory
Interior point algorithms for linear optimization and linear complementarity problems
Exchange market equilibrium models
Real-life applications of operations research

Employment

Assistant research fellow September 2016 – August 2018
Budapest University of Technology and Economics Budapest, Hungary
Department of Differential Equations
Joint research with Levente Mályusz from the Department of Construction Technology and Management

Fellowships

ÚNKP-20-3 September 2020 – August 2021
New National Excellence Program of the Ministry for Innovation and Technology
Title: New long-step interior point algorithms for the linear programming problem

Publications

A new Ai-Zhang type interior point algorithm for sufficient linear complementarity problems
Marianna E.-Nagy, Anita Varga
Corvinus Economics Working Papers, CEWP 03/2022, 2022.

A new long-step interior point algorithm for linear programming based on the algebraic equivalent transformation
Marianna E.-Nagy, Anita Varga
Corvinus Economics Working Papers, CEWP 06/2021, 2021.

A numerical comparison of long-step interior point algorithms for linear optimization
Marianna E.-Nagy, Anita Varga
SOR '21 Proceedings - The 16th International Symposium on Operational Research in Slovenia, 75-80, 2021.

Integrating combinatorial algorithms into a linear programming solver
Richárd Molnár-Szipai, Anita Varga
Central European Journal of Operations Research, 27(2), 475-482, 2019.

An estimation of the learning curve effect on project duration with Monte Carlo simulation
Levente Mályusz, Anita Varga
Periodica Polytechnica Architecture, 49(1), 66-71, 2018.

An estimation of the learning effect on project cost scheduling
Levente Mályusz, Anita Varga
Procedia Engineering, 196, 723-729, 2017.

An estimation of the learning curve effect on project scheduling with calendar days calculation
Levente Mályusz, Anita Varga
Procedia Engineering, 196, 730-737, 2017.

An estimation of the learning curve effect on project scheduling with working days calculation
Levente Mályusz, Anita Varga
Periodica Polytechnica Architecture, 47(2), 104-109, 2016.

Research projects

Member of the Optimization Research Group, 2018–2019, 2019–2020
Higher Education Excellence Program of the Ministry of Human Capacities in the frame of Artificial Intelligence research area, "Future Mobility",
Budapest University of Technology and Economics (BME FIKP-MI/FM)

Participant of the project 2017 – 2020
"Extending first- and second order algorithms for nested classes of optimization problems to solve computationally challenging industrial questions"

International cooperation between Slovenia and Hungary, Hungarian Research Fund, OTKA/NKFIH No. NKFIH 125700

Applied projects

Participant of the project 2020–2021
"Optimization models for an electricity generation planning problem"
NLO Ltd., Budapest

Participant of the project 2017–2018
"Developing high quality e-courses in mathematics for engineering and economics students of the Hungarian higher education"
ELMS Informatikai Zrt., Budapest

"Investigating the learning curve effect on project scheduling" 2016–2018
Joint research with Levente Mályusz,
Budapest University of Technology and Economics, Department of Construction Technology and Management

"Integrating combinatorial algorithms into a linear programming solver" 2014–2016
MSc thesis, supervisor: Richárd Molnár-Szipai
We developed a new XPRESS module that connects the solver to the LEMON C++ library.
Budapest University of Technology and Economics, Department of Differential Equations

"A mixed integer linear programming model for the arrangement of material depots on construction sites" 2014-2016
MSc Individual Project, Supervisor: Levente Mályusz,
Budapest University of Technology and Economics, Department of Construction Technology and Management

Teaching experience

Courses at Budapest University of Technology and Economics 2015 – present
Operations Research Software (computer laboratory course)
Optimization Models (computer laboratory classes)
Practical courses in Operations Research
Practical courses in Calculus

Supervision of students 2019 – present

Ágnes Molnár, BSc Thesis
Title: An algorithm for solving the Fisher model with linear utility functions
Budapest University of Technology and Economics, 2021

Barnabás Molnár, BSc Thesis
Title: Methods for solving the Arrow-Debreu market exchange model with linear utility functions
Budapest University of Technology and Economics, 2020

Boglárka Tauber, BSc Thesis
Title: A personnel scheduling problem with employee preferences
Budapest University of Technology and Economics, 2019

Memberships

Member of the Hungarian Operations Research Society (MOT) 2018 – present

Conference talks

Day of Hungarian Science in Transylvania, 12th Conference on Mathematics and Informatics with Applications, 2021
Title of the presentation: New long-step interior point algorithm with modified search directions for solving linear complementarity problems (in Hungarian, online presentation)

The 16th International Symposium on Operational Research in Slovenia, Bled, 2021
Title of the presentation: A Numerical Comparison of Long-Step Interior Point Algorithms for Linear Optimization (online presentation)

XXXIV. Hungarian Operations Research Conference, Cegléd, 2021
Title of the presentation: A family of new long-step interior point algorithms for linear optimization (in Hungarian)

The 31st European Conference on Operational Research, Athens, Greece, 2021
Title of the presentation: A new long-step interior point algorithm for sufficient linear complementarity problems with transformed search directions (online presentation)

Day of Hungarian Science in Transylvania, 11th Conference on Mathematics and Informatics with Applications, Kolozsvár, 2020
Title of the presentation: A new $O(\sqrt{n}L)$ complexity long-step interior point algorithm for linear optimization (in Hungarian, online presentation)

The 15th International Symposium on Operational Research in Slovenia, Bled, 2019
Title of the presentation: Interior Point Heuristics for a Class of Market Exchange Models

The 30th European Conference on Operational Research, Dublin, Ireland, 2019

Title of the presentation: A new interior point algorithm for the Fisher type market exchange model

The 8th VOCAL Optimization Conference: Advanced Algorithms, Esztergom, 2018
Title of the presentation: A new interior point algorithm for a class of market equilibrium problems

The 17th International Conference on Operational Research KOI, Zadar, 2018
Title of the presentation: Young programming and its solution methods

The 2nd Hungarian – Slovenian Operations Research Workshop on OR Algorithms and High Performance Computing, Budapest, 2018
Title of the presentation: Market equilibrium problems with Leontief's utility functions

The 16th EUROPT Workshop on Advances in Continuous Optimization, Almería, 2018
Title of the presentation: Young-programming: algorithms and applications

The 1st Hungarian – Slovenian Operations Research Workshop on OR Algorithms and High Performance Computing, Gosztola, 2018
Title of the presentation: Market equilibrium problems with linear and Leontief's utility functions

The 7th Vocal Optimization Conference: Advanced Algorithms, Esztergom, 2016
Title of the presentation: Integrating combinatorial algorithms into a linear programming solver

Computer skills

C/C++, MATLAB, Wolfram Mathematica, XPRESS-Mosel, AMPL, GAMS, Microsoft Office, TeX

Languages

Hungarian (native language)
English (B2 level)
Spanish (B1 level)